US Army Corps of Engineers ®
Chicago District

BUBBLY CREEK, SOUTH BRANCH OF THE CHICAGO RIVER, ILLINOIS RECONNAISSANCE STUDY

RECONNAISSANCE STUDY

905(b) ANALYSIS RECONNAISSANCE REPORT

FEASIBILITY STUDY PROJECT MANAGEMENT PLAN

FEASIBILITY COST SHARING AGREEMENT

AUGUST 2007

BUBBLY CREEK,
SOUTH BRANCH OF THE CHICAGO RIVER
RECONNAISSANCE STUDY

This report documents the Bubbly Creek, South Branch of the Chicago River Reconnaissance Study, which was initiated in January 2006 and completed with the execution of the Feasibility Cost Sharing Agreement in August 2007. The Chicago District of the U.S. Army Corps of Engineers developed the reconnaissance study in conjunction with the project's prospective non-Federal sponsor, the City of Chicago.

The Bubbly Creek, South Branch of the Chicago River Reconnaissance Study accomplished the following six essential tasks:

(1) Determined that the water resource problems identified within the study area warrants Federal participation in a feasibility study;

(2) Defined Federal interest based on a preliminary appraisal consistent with Army policies, costs, benefits, and environmental impacts of identified potential project alternatives;

(3) Completed a 905(b) Analysis Reconnaissance Report;

(4) Prepared a coordinated Project Management Plan (PMP) for the feasibility study;

(5) Assessed the level of interest and support of non-Federal entities in the identified potential solutions and cost-sharing of feasibility, design and construction phases. The City of Chicago stating in a letter of intent their willingness to pursue the cost shared feasibility study described in the PMP and to share in the costs of construction as required; and

(6) Negotiated and executed a Feasibility Cost Sharing Agreement (FCSA).

Contained within this report under separate tabs are the three major products of the Bubbly Creek, South Branch of the Chicago River Reconnaissance Study:

(1) 905(b) Analysis Reconnaissance Report which was approved by the Great Lakes and Ohio River Division of the U.S. Army Corps of Engineers on 20-Apr-2007. A letter of intent from the City of Chicago Department of Environment dated 01-Aug-2006 is included as an attachment to this report.

(2) Feasibility Study Project Management Plan which was approved by the project delivery team members, office chiefs, and representatives of the Chicago District and the City of Chicago in August 2007.

(3) Feasibility Cost Sharing Agreement which was executed on 16-Aug-2007 between the Chicago District and the City of Chicago.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DIVISION, GREAT LAKES AND OHIO RIVER
CORPS OF ENGINEERS
550 MAIN ST.
CINCINNATI, OH 45202

CELRD-PDS-P (1105) 20 April 2007

MEMORANDUM FOR Commander, Chicago District

SUBJECT: Bubbly Creek, South Branch of the Chicago River, Illinois; Reconnaissance Study Section 905 (b) Analysis (WRDA 86)

1. References:
   a. CELRC-PM-PL memorandum, subject as above, dated 29 Aug 06
   b. CECW-MVD memorandum, subject "Delegation of Approval Authority for Section 905(b) Reports," dated 3 May 04

2. Policy compliance and quality management verification for the subject report have been completed in coordination with the HQUSACE Planning and Policy Division. There was joint agreement by HQUSACE Planning and Policy Division and this Division office that the 905(b) should be approved and the study can proceed into the feasibility phase upon preparation of a project management plan and preparation and execution of a FCSA.

3. Early and continued coordination with higher headquarters is strongly recommended to address potential policy issues related to proposed project features including remediation of contaminated sediments.

4. Per the amended guidance on Peer Review (EC 1105-2-408), the District is directed to coordinate with the MVD Planning Center of Expertise on Ecosystem Restoration and this office on the development of a Peer Review Plan.

5. The subject report is hereby approved and the District may proceed with negotiation and execution of a Feasibility Cost Sharing Agreement.

FOR THE COMMANDER:

Theodore A. Brown, PE, MBA
for MICHAEL B. WHITE, P. E.
Director of Civil Works & Management

cf: CELRD-PDC (Sadri)
CELRD-PDS-G (Miller)

RECONNAISSANCE STUDY
Section 905(b) (WRDA 86) Analysis
Bubbly Creek, South Branch of the Chicago River
18 August 2006

1. STUDY AUTHORITY:

a) This study is being conducted in accordance with the study resolution adopted by the Committee on Environment and Public Works, United States Senate, July 20, 2005. The study resolution authority reads as follows:

"Resolved by the Committee on Environment and Public Works of the United States Senate, that, the Secretary of the Army, is requested to review the report of the Chief of Engineers on the Illinois River, Illinois submitted in Senate Document Numbered 126, Seventy-first Congress, second session, and other pertinent reports, to determine whether any modifications to the South Fork of the South Branch of the Chicago River (commonly known as Bubbly Creek) for ecosystem restoration is advisable at this time."

b) Funds in the amount of $200,000 were appropriated by Congress in Fiscal Year 2006 to conduct the reconnaissance phase of the study. Any remaining funds will be carried over to FY07 to initiate feasibility once approval is received.

2. STUDY PURPOSE:

The purpose of this reconnaissance study is to identify ecosystem restoration opportunities that the Federal Government would have an interest in studying further based on policy guidance for the Corps of Engineers. In response to the study authority, the reconnaissance study was initiated in January 2006. The reconnaissance study has resulted in the finding that there is a Federal interest in participating in a cost-shared feasibility phase study to investigate ecosystem restoration improvements to the South Fork of the South Branch of the Chicago River. The purpose of this Section 905(b) Analysis is to document the basis for this finding and establish the scope of the feasibility phase. As the document that establishes the scope of the feasibility study, the Section 905(b) Analysis is used as the chapter of the Project Management Plan that presents the reconnaissance overview and formulation rationale. Further detailed analysis to determine ecosystem restoration measures will be provided in the feasibility phase.

3. LOCATION OF STUDY, NON-FEDERAL SPONSOR AND CONGRESSIONAL DISTRICT:

a) Study Area: The study area includes the entire 1.25 mile channel of the South Fork of the South Branch of the Chicago River, colloquially referred to as "Bubbly Creek" located entirely within the City of Chicago, Cook County, Illinois. A once sluggishly

flowing channel that drained an area of 5 square miles of wetlands has since been severely altered by human development. Bubbly Creek was once a pristine wetland system that provided natural aquatic and terrestrial habitats for fish, bird, and mammal species. Bubbly Creek has endured major physical alterations including deepening and widening of the channel, creation of sheet pile banks, complete filling of wetlands within the original drainage area, severe hydrologic alterations, and introduction of polluted sediments and runoff. Today, the Bubbly Creek channel begins near Racine Avenue and 38th Street at the Racine Avenue Pumping Station (RAPS) and flows north into the South Branch of the Chicago River near Ashland Avenue as shown in *Figure 1* below.

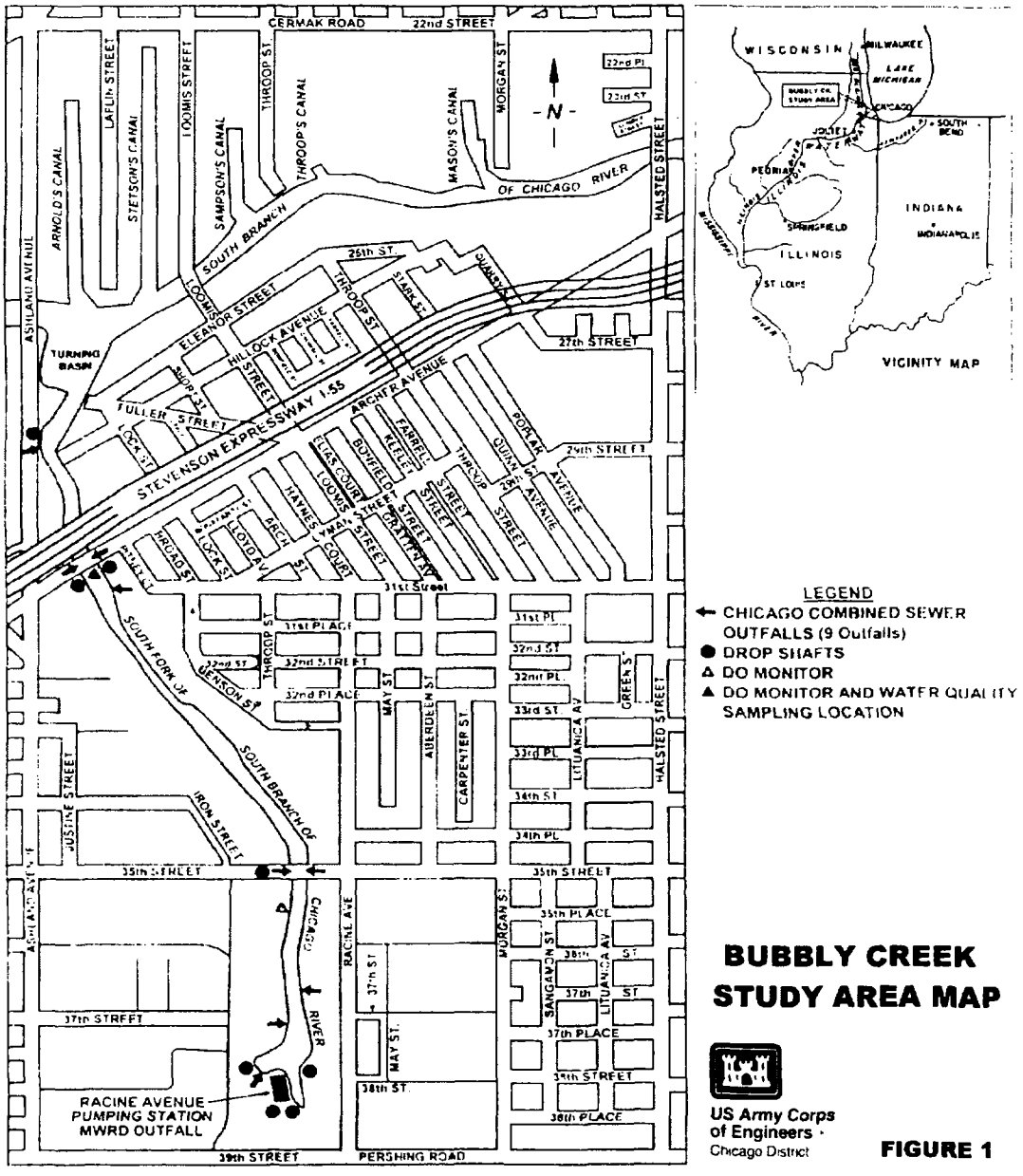


Figure 1: Bubbly Creek Study Area Map

b) Non-Federal Sponsor: City of Chicago, Department of Environment (DOE)

c) Congressional District: 3rd Congressional District, Congressman Daniel Lipinski
4th Congressional District, Congressman Luis Gutierrez

U.S. Senators Richard Durbin and Barack Obama

4. PRIOR REPORTS AND EXISTING PROJECTS:

a) Corps of Engineers reports:

- USACE, Chicago District, *Section 206 Preliminary Restoration Plan for the South Fork of the South Branch of the Chicago River (Bubbly Creek), Chicago Illinois*, 2003.

  The Chicago District received a letter from the City of Chicago, Department of Environment in July 2002 requesting assistance under Section 206 of the Continuing Authorities Program (CAP) to address problems with degraded aquatic habitat in the Chicago River in the vicinity of Bubbly Creek. The District produced a preliminary restoration plan for Bubbly Creek recommending further study under the CAP Section 206 authority. During the feasibility phase of the Section 206 study, the estimated costs of the project were determined to exceed the Section 206 authority project limits and the project was converted to a general investigation study.

- USACE, Chicago District, *Collection and Analysis of Sediment Samples from the South Fork South Branch, Chicago River, Draft Final Report*, 2004.

  One of the first activities performed by the CAP Section 206 feasibility phase was to characterize the existing sediments within Bubbly Creek. Limited sediment characterization was available by the Illinois Environmental Protection Agency (IEPA) and the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). The Chicago District contracted with Camp Dresser and McKee Engineers (CDM) to perform sediment core sampling and analysis of the bottom sediments. Thirteen core samples and five grab samples along the entire length of Bubbly Creek were sampled and analyzed. Results from the analysis concluded that the material was not found to be characteristically toxic, corrosive or reactive under RCRA, but further analysis of ignitability is required.

b) Other studies and reports pertaining to the study area:

- City of Chicago, Department of Planning and Development, *Chicago River Corridor Development Plan*, 1999.

The Chicago River Corridor Development Plan and Design Guidelines are the result of a collaborative effort among government agencies, private sector developers, and non-profit organizations to create a blueprint for the future of the Chicago River. The goal of the plan is to enhance the river's attractiveness as a natural and recreational resource while respecting the needs of residential and business developments. Approved by the Chicago Planning Commission in 1998, the plan sets forth a shared vision for the river and outlines specific recommendations to be completed over the next 10 years. Components of the plan include specific recommendations for improvements to public and private land that support the goals of the plan, and strategies for preserving and enhancing the river's natural areas.

- MWRDGC, Research and Development Department, *Bubbly Creek Water Quality Improvement Demonstration Project in 2002*, Report 03-01, 2003.

  This report provides results of a demonstration project performed in the summer of 2002 by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) with the goal of improving water quality in Bubbly Creek. The demonstration project involved opening a gate at the Racine Avenue Pumping Station (RAPS) to allow water from Bubbly Creek to discharge through the intercepting sewer system, thereby establishing a flow in the creek when otherwise it would have been stagnant. The demonstration project lasted about 3 months where approximately 2.5 billion gallons were drawn through the creek and treated at their water reclamation plant (WRP) at an estimated cost of $625,000. Water quality monitoring showed a marked improvement to dissolved oxygen (DO) during dry weather flows and recommendations for further demonstration project operations were made.

- MWRDGC, Research and Development Department, 2003 *Bubbly Creek Water Quality Improvement Demonstration Project*, Report 04-08, 2004.

  This report provides results of a second-year demonstration project performed by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) with the goal of improving water quality in Bubbly Creek. This additional demonstration project investigated a wider range of flows than the initial study. The demonstration project lasted 6 months where approximately 2.1 billion gallons were drawn through the creek at an estimated cost of $525,000. Hydrologic conditions varied greatly in the second-year demonstration project over the first-year project in that combined sewer overflow (CSO) discharges numbered eight overflow events versus two the previous year. Water quality monitoring showed marked improvements to dissolved oxygen (DO) during dry weather flows and reductions in periods of low DO following CSO events. Recommendations for further study of sediment oxygen uptake and the impact of algal respiration on DO levels were made. The report also states that the method of artificial flow creation used in this demonstration project cannot be used as a long-term solution for the water quality improvements in Bubbly Creek since it

requires capacity at the WRP that may not be available in wet weather along with significant additional operating costs.

- IEPA. Use Attainability Analysis for the Chicago Area Waterway System, Draft Report, 2004.

  The Illinois Environmental Protection Agency (IEPA) has the responsibility to establish standards for the waterways in Illinois. Part of the standard-setting process is based on how the waterways are being used and by what entities. IEPA performed a Use Attainability Analysis (UAA) of the Chicago Area Waterway System (CAWS) to help understand the changing circumstances of the waterways in order to better set the standards. The Illinois Pollution Control Board (IPCB) recently upgraded three reaches of CAWS due to water quality improvements without going through the rigors of a UAA study. This study analyzed whether a use upgrade for currently designated *Secondary Use* reaches are achievable, by what means could limiting factors be controlled, and to determine whether the recent upgrades of *General Use* reaches in CAWS were appropriate. This study involved comprehensive data gathering in terms of water quality, sediment chemistry, biological, habitat, hydrological, waterway use, recreational, and aesthetics. The UAA study recommends Bubbly Creek remain a *Secondary Use* reach along with a suite of management strategies to be implemented in order to control limiting factors. The report recommends several strategies for Bubbly Creek including flow augmentation and aeration to address low dissolved oxygen levels, in stream habitat to improve fish communities, sediment removal to improve aquatic life conditions, and disinfection to protect for water recreation.

5. PLAN FORMULATION:

Overall Planning Process:

The six-step planning process laid out in the Water Resources Council's Principles and Guidelines was used to guide the planning process and to identify and select alternatives to pursue in more detail during the feasibility phase. The six planning steps are: 1) identify problems and opportunities, 2) inventory and forecast conditions, 3) formulate alternative plans, 4) evaluate effects of alternative plans, 5) compare alternative plans, and 6) select recommended plan. Identifying problems and opportunities are emphasized for this reconnaissance study. Due to time and funding constraints, the scope of work to formulate, evaluate, compare and select a recommended plan are limited to existing information. This reconnaissance study will provide a preliminary investigation of potential solutions for ecosystem restoration. This information will be refined through future iterations of the planning steps that will be accomplished during the feasibility phase.

a) National Objective:

The Corps has a national objective for ecosystem restoration in response to legislation and administration policy. The National Ecosystem Restoration (NER) objective is to contribute to the restoration of the Nation's ecosystems through implementation of ecosystem restoration projects, with contributions measured by changes in the amounts of ecological outputs.

b) Public Concerns:

During the preparation of this report, several meetings were held with the potential sponsor and several other federal, state, regional, and local stakeholders including:

- City of Chicago, Department of the Environment (DOE); potential local sponsor
- U.S. Environmental Protection Agency, Region V (USEPA)
- Illinois Environmental Protection Agency (IEPA)
- City of Chicago, Department of Planning and Development (DPD)
- City of Chicago, Mayor's Office (MO)
- City of Chicago, Department of Water Management (DWM)
- Metropolitan Water Reclamation District of Greater Chicago District (MWRDGC)
- Friends of the Chicago River (FCR)
- The Wetlands Initiative (TWI)

A number of public concerns regarding Bubbly Creek have been identified during these discussions. The public concerns are related to the establishment of planning objectives and planning constraints. The following public concerns were identified:

- Majority of the time Bubbly Creek is stagnant due to major hydrologic alterations, which contribute to low water quality and aquatic habitat degradation.
- Bubbly Creek receives combined sewer overflows from RAPS and other CSO outfalls along the channel during major rain events. These CSOs contribute to water quality degradation, aquatic habitat degradation, increased solids loadings, and the introduction of floating debris.
- The sediments contained within Bubbly Creek are the remnants of raw sewage and waste from previous meatpacking industries that lined its banks. These sediments contain high levels of organics that continually decompose anaerobically producing methane and hydrogen sulfide gas in bubble form thus contributing to water quality and aquatic habitat degradation.
- Bubbly Creek is critical for providing flood relief to a 30 square mile area of the south side of Chicago by receiving overflows. The conveyance capacity of the channel must remain viable to accept the 6,000-cfs maximum overflows from RAPS and additional overflow capacity from nine CSO overflows along the channel. Maintaining existing channel conveyance capacity in order to not induce additional flooding must be taken into account throughout the planning process.

- Due to water quality problems, Bubbly Creek is classified as a secondary use water body for limited contact. Plans to revitalize the surrounding area are limited by its current degraded state.
- Bubbly Creek offers limited recreational opportunities for millions of residents of the local surrounding community.
- Currently, Bubbly Creek is not aesthetically pleasing as the channel produces frequent foul odors and collects unsightly floating debris following a CSO event.

c) Problem Identification:

General / Background -

Historically, the Chicago River system was essentially a wetland complex that sluggishly flowed east into Lake Michigan. The drainage area of the Chicago River was unique in that its boundary with the Des Plaines River to the west formed a continental divide separating the Great Lakes and St. Lawrence River watershed from the Mississippi River drainage basin. One location of the continental divide called Mud Lake, just two miles west of Bubbly Creek, was quite low and ill-defined allowing sporadic overflows to the Mississippi River basin during spring floods, which periodically connected these great basins. This unique topographic characteristic allowed for a permanent connection between the two basins possible. In 1848 the completion of the Illinois and Michigan Canal, which originated at the confluence of Bubbly Creek and the South Branch of the Chicago River, created an efficient water trade route between the basins sparking the rapid growth and development of the Chicago area. In 1900, a larger connection was created with the completion of the Chicago Sanitary and Ship Canal, which in turn permanently reversed the flow of the Chicago River and its drainage from Lake Michigan to the Illinois River and down the Mississippi River.

The South Fork of the South Branch of the Chicago River and its tributaries were once clear meandering creeks that slowly drained the vast marshland that occurred within its original 5 square mile drainage area. This once pristine ecosystem provided natural aquatic and terrestrial habitats for many fish, bird, and mammal species. Over a period of several decades, this pristine ecosystem was severely altered by human development. In the early 1860's the Union Stock Yards were constructed along the banks of the South Fork and this small stream became an open sewer and disposal site for large quantities of blood, offal, hair, and other animal wastes from the meatpacking industry. The channel was systematically deepened and widened to allow for drainage and disposal of wastes from the nearby meatpacking industries. Biochemical reactions caused by decomposing animal waste continuously produce methane and hydrogen sulfide bubbles. To this day these bubbles constantly float to and break at the water surface, for which the name "Bubbly Creek" is colloquially given. In 1923, the last tributary to Bubbly Creek, West Arm of the South Fork, was completely filled in as a remediation solution to the vast quantities of waste dumped in that channel. The Union Stockyards closed in 1971 after 105 years of meat production. The impact which the Union Stockyards have on the landscape and its vast physical alterations to Bubbly Creek and the surrounding area remains today.

During the development of Chicago in the late 1800s and early 1900s, a vast sewer system was constructed to collect sanitary waste and storm runoff and convey it via massive underground combined sewers to the areas river system. A 30-square mile area of the central and south side of the City of Chicago originally drained to Bubbly Creek by gravity. Conditions in the channel degraded to a point where a bypass connection was constructed to pump fresh water from Lake Michigan to flush the system during dry weather. In 1939, the worlds largest pump station, Racine Avenue Pumping Station (RAPS), was constructed and dry weather flows were diverted to the Stickney Water Reclamation Plant (WRP) for treatment instead of directly discharging raw sewage to Bubbly Creek. Over the years, increases to treatment capacity at the WRP have reduced the amount of overflows that occur. The construction of the Tunnel and Reservoir Plan (TARP), which encompasses a system of deep tunnels and massive reservoirs used to store overflows, have drastically reduced the amount of combined sewer overflows (CSOs) to area rivers. Currently the tunnel portion of the project is complete, thus reducing the number of CSOs at RAPS to approximately 17 times per year. Unfortunately, even with the TARP project completed, with construction of the McCook reservoir currently scheduled for 2023 completion, overflow capacity will still be required at RAPS, albeit less frequently, in order to prevent local flooding and basement backup during large storm events.

Today, Bubbly Creek is a relatively straight 6,600-foot channel that originates at the RAPS and flows north during overflow events to its confluence with the South Branch of the Chicago River. The channel is mostly lined with vertical walls made of steel sheet pile, concrete, or wood and few areas of steep rocky soils as shown in *Figure 2* below. A mix of land uses are found along the banks of Bubbly Creek including industrial plants, trucking terminals, rail yards, and construction material yards which are giving way to new commercial and residential development. Channel depths vary from approximately 6-feet near RAPS to 14-feet at its mouth and channel widths vary between 120 to 200-feet wide. The major physical alterations caused by development has severely degraded the natural ecosystem and eliminated most of the natural aquatic and terrestrial habitats. Due to hydrologic alterations, existing bottom sediments, combined sewer overflows, and lack of riparian and in-stream habitats, Bubbly Creek remains a severely impaired ecosystem with vast opportunities for restoration. Unfortunately, Bubbly Creek has been altered and degraded so severely that simply restoring aquatic and terrestrial vegetation, reintroducing natural bottom substrates, altering the channel form, and creating wetlands will not work on their own. Sustainable conditions must be met in order for ecosystem restoration to take hold and succeed.

Below is a discussion of specific problems that contribute to the degradation of Bubbly Creek and which must be solved in order to allow for successful ecosystem restoration. The first four problems identified below including stagnant flow conditions, combined sewer overflows, poor sediment quality and poor water quality all contribute to the degradation of habitat and biological integrity and must be addressed in order to provide sustainable conditions for ecosystem restoration. Successful ecosystem restoration is dependent upon restoring the conditions needed for sustainability. Bubbly Creek faces a

complex series of problems, which in turn will require an equally complex set of restoration solutions.

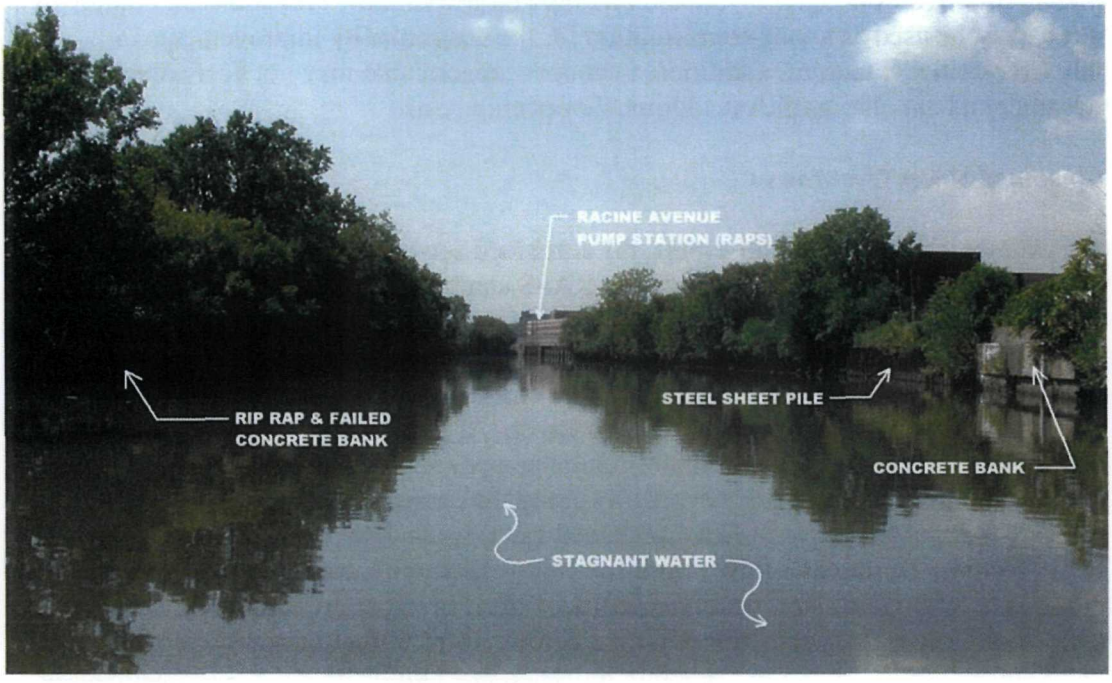


Figure 2: Bubbly Creek Looking Upstream from 35th Street

(1) *Stagnant Flow Conditions* -

During dry weather periods Bubbly Creek is stagnant, except for the occasional movement of water caused by a passing boat or slight surge from the South Branch. Following light to moderate rainstorms, flow in Bubbly Creek is not noticeably changed since most rainfall runoff is captured in the combined sewer system and conveyed for treatment and released downstream. Only small areas adjacent to the channel drain directly to Bubbly Creek and runoff is too limited to significantly impact flows. Due to this short-circuiting affect on drainage, Bubbly Creek functions more like a lake system than a river system the majority of the time. During stagnant periods, severely degraded water quality in Bubbly Creek can be attributed to several factors including the biochemical interaction between the sediment and the water column, residual water quality from CSOs, and photosynthetic activity. Levels of dissolved oxygen (DO), which are good indicators of water quality impairment, typically plummet during stagnant periods and often reach zero.

Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) which operates RAPS conducted a demonstration project where flows were artificially introduced to Bubbly Creek during dry weather by opening a gate at RAPS to allow water to enter the interceptor sewers and be pumped for treatment, thereby establishing a reverse flow in the creek when otherwise it would have been stagnant. MWRDGC performed this demonstration project for two summers with success in improving dry

weather water quality at a cost of nearly $1.2 million dollars in added operating costs. It was determined that the creation of an artificial flow during dry weather flows can drastically improve water quality, but the method of artificial flow creation used in this project cannot be used as a long-term solution for the water quality improvements in Bubbly Creek since it requires additional treatment capacity that may not be available in wet weather and entails significant additional operating costs.

(2) *Combined Sewer Overflows* -

During excessively heavy rainfall events, the combined sewer system that drains surface water runoff and sanitary waste by gravity to RAPS can become overwhelmed. In order to prevent local flooding and basement backup within the sewershed, pumps at RAPS are turned on to discharge CSO to Bubbly Creek when the capacity of the sewer system is reached. When this occurs, the water level in the creek rises forcing the CSO to flow north toward the South Branch of the Chicago River. At maximum overflow capacity, RAPS can discharge approximately 6,000 cubic feet per second. Combined with additional flow from adjacent CSO overflows along the channel, the upstream water levels near RAPS can rise over 3 feet and velocities in the channel can reach in excess of 5 feet per second. During overflow events the water quality in the channel is severely degraded as CSO contains significant quantities of fresh sewage, street runoff solids, and some floatable materials as shown in *Figure 3* below. In addition to water quality degradation, riverine habitats are severely impacted due to high channel velocities caused by CSO discharges.

Figure 3: Floatable Debris Collected at RAPS Following a CSO Event

In the ten-year period between 1996 through 2005, overflow pumping to Bubbly Creek at RAPS had occurred 14 times per year on average. The highest was 21 times in 2001 and

the lowest was 9 times in 2005. The duration of pumping varied from a few hours to a day or more, depending on the amount and duration of rainfall. The completion of the Tunnel and Reservoir Plan (TARP), which encompasses a system of deep tunnels and massive reservoirs used to store overflows, will reduce the frequency of overflows to Bubbly Creek. In the interim period before the completion of TARP, the City of Chicago is implementing a plan to reduce the volume of stormwater entering the combined sewer system by utilizing Best Management Practices (BMPs) citywide. Unfortunately, the TARP project will not eliminate all CSOs, therefore pumping from RAPS will continue to occur when intense storms with large rainfall amounts hit the south side of Chicago.

(3) *Sediment Quality* -

The sediments within the Bubbly Creek channel contain remnants of animal wastes such as carcasses, hair, and offal from the meat processing plants that previously lined its banks, raw sewage once directly dumped into the channel, and solids contained in combined sewer overflows still released by RAPS and other CSO outfalls along the channel. The Illinois Environmental Protection Agency (IEPA), U.S. Environmental Protection Agency (USEPA), Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), and USACE have all performed past sediment sampling and bulk chemistry analyses are consistent among these sampling events. The Chicago District collected the bulk of sediment information available in the spring of 2004. Thirteen core samples and five grab samples along the entire length of Bubbly Creek were sampled and analyzed. Sediment depths ranged between 5.5 and 16.8 feet and consisted primarily of sand and clay. Results of bulk chemistry and Toxicity Characteristic Leaching Procedure (TCLP) testing show that sampled sediment does not exceed toxicity criteria established under the Resource Conservation and Recovery Act (RCRA), or maximum allowable polychlorinated biphenyl (PCB) concentrations established under Toxic Substances Control Act (TSCA).

Sediment samples all showed elevated levels of polycyclic aromatic hydrocarbons (PAHs) and heavy metals. Other detected contaminants included semi volatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), oil and grease, and nutrients. A close examination of existing sediment quality will be completed during the feasibility study as disposal locations and costs can significantly alter the feasibility of measures addressing sediment quality. Additional sediment sampling may be needed depending on measures considered during the feasibility study. Biochemical reactions within the sediment caused by anaerobic organic decomposition produce methane and hydrogen sulfide bubbles that constantly float to the surface sometimes carrying clumps of sediment when made buoyant by entrapped gas bubbles as shown in *Figure 4* below. These clumps eventually sink when entrained gas vents to the atmosphere. Odors produced by the gases and the appearance of these clumps is aesthetically unpleasant.

The City of Chicago, in partnership with The Wetlands Initiative, the University of Illinois at Chicago, and MWRDGC, is pursuing an active capping demonstration project for the turning basin at the confluence of Bubbly Creek and the South Branch to

demonstrate contaminant sequestration and reduction of exposure to the contaminated sediments. Results from this project could provide invaluable information that would be used in the formulation and evaluation of sediment remediation measures for the entire channel during feasibility phase.

Figure 4: Clumps of Sediment and Gas Bubbles at the Surface of Bubbly Creek

(4) *Water Quality* -

In general, the water quality in the Chicago Waterway system is marginal, but constantly improving. Bubbly Creek is classified for *Secondary Use* by the Illinois Pollution Control Board (IPCB), which indicates the water is only suitable for limited contact activities such as boating and fishing. Bubbly Creek is also listed as an impaired stream by IEPA according the Section 303(d) of the Clean Water Act. The listed causes of impairment include high pH, low dissolved oxygen, and high total phosphorus with combined sewer overflows as the primary source of impairment. Stagnant flow conditions and the biochemical interaction with contaminated sediments also contribute to water quality degradation. Water quality is critical to maintaining high quality habitats needed to support diverse fish and wildlife populations. Poor water quality severely limits the aquatic habitat and communities within Bubbly Creek

(5) *Habitat and Biological Integrity* -

Currently, Bubbly Creek no longer maintains hydro-geomorphic function that historically provided the means for a broad diversity of habitats to exist. Thus, this system no longer supports healthy and rich plant and animal communities. The health of the Bubbly Creek ecosystem has severely declined in response to a loss of habitat to support various life stages of aquatic and terrestrial biota and a reduction in habitat quality due to several factors. The lack of flow diversity caused stagnant flow conditions and high velocities from combined sewer overflows has resulted in severe habitat degradation. Poor

sediment quality and the biochemical reactions from organic decomposition further degrade the aquatic habitat for fish and macroinvertebrates. Poor water quality caused by combined sewer overflows, hydrologic alterations, and reactions with underlying sediments also contribute to habitat degradation. The channel is absent of any aquatic vegetation, physical structure, or lotic characteristics, which would provide the basis for healthy and diverse riverine communities.

An Index of Biotic Integrity (IBI) was used to assess the status and probable improvements to the riverine ecosystem of Bubbly Creek in lieu of ecological restoration. This IBI may be viewed as a quantitative empirical index for rating the health of a riverine ecosystem with a scale between 0 and 60. A spring fish survey was performed where six species were collected, all consisting of tolerant and / or non-native species. Based on structural, compositional, and functional components of the fish community surveyed, Bubbly Creek received an IBI score of 10. This score corresponds to a very poor rating and is characterized as an imperiled aquatic ecosystem in which biotic integrity has been severely reduced.

(6) *Recreation* -

Limited recreational activities occur along Bubbly Creek. At the confluence with the South Branch of the Chicago River, the South Chicago Rowing Center has a small boat launch. Bank fishing is also common at the confluence of Bubbly Creek. Many new developments that are being constructed along the Chicago River including Bridgeport Village, a new single-family residential development area along a portion of the east bank of Bubbly Creek. Many of these developments are creating river walks to connect the waterways to residents. Due to the poor water quality and the lack of aquatic habitat and biological integrity, additional recreational opportunities are limited. Foul odors and unsightly floating debris can also limit recreational user of from Bubbly Creek.

d) Opportunities:

Improve Stagnant Flow Conditions – Feasibility phase and other studies can provide opportunities to restore flow to the channel during normal and dry weather conditions. The introduction of flows to the channel can significantly improve water quality, increase and improve riverine habitat, provide environmental benefits for fish and wildlife, and improve the aesthetics of the channel.

Reduce Combined Sewer Overflows – Feasibility phase and other studies can provide opportunities to reduce impacts of combined sewer overflows. Reduced combined sewer overflows can significantly improve water quality by helping to control point sources of pollution and provide environmental benefits for fish and wildlife. In addition, reducing extremely high flow velocities experienced during overflow events can greatly benefit the aquatic ecosystem by allowing natural structure to establish and remain intact.

Improve Sediment Quality – Feasibility phase and other studies can provide opportunities to reduce contaminant migration from existing sediments. Removal or capping of bottom

sediments can significantly improve water quality by controlling contaminant migration, increase and improve substrates and macroinvertebrate habitats, and provide environmental benefits for fish and wildlife.

Improve Water Quality – Feasibility phase and other studies can provide opportunities to benefit water quality. Increased water quality can significantly increase and improve fish community habitat, provide environmental benefits for fish and wildlife, and improve the aesthetics of the channel.

Increase Habitat and Biological Integrity – Feasibility phase and other studies can provide opportunities to increase or improve riverine habitat, improve riparian habitat along the channel, restore native plant communities within the river corridor, restore wetlands, and restore stream processes to a more natural condition allowing for increased biological integrity.

Increase Recreational Opportunities – A future ecosystem restoration project would provide important opportunities for development of public recreation. Both land-based and water based facilities could be incorporated into a restoration plan and would provide an opportunity for State, city, and local entities to implement some of their recreation plans and ideas. The project could also provide the opportunity for cultural, historic, and scenic preservation.

e) Expected Future Without-Project Conditions:

The future without-project condition of Bubbly Creek is expected to remain in a highly degraded state. Stagnant conditions, combined sewer overflows, and contaminated sediments will continue to contribute to poor water quality, severe habitat degradation, and continued loss of habitats that support various life stages of aquatic and terrestrial biota. Water quality is projected to slightly improve once the TARP system is fully operational due to less frequent CSO events. Since overflows will not be completely eliminated by TARP, water quality degradation from CSO discharges will continue. Without major restoration, Bubbly Creek will remain classified as a limited contact water body also contributing to major limitations on recreational opportunities.

f) Planning Objectives:

The following planning objectives are specific to Bubbly Creek:

- Improve normal flow conditions
- Reduce impacts of combined sewer overflows
- Reduce exposure to and environmental impacts from bottom sediments
- Improve water quality since it is the limiting factor to habitat restoration
- Provide diverse aquatic and related habitats
- Improve river corridor aesthetics
- Provide recreational opportunities

g) Planning Constraints:

- Bubbly Creek provides conveyance to combined sewer overflows from RAPS and adjacent sewers. These overflows provide additional capacity to the combined sewer system that drains a major portion of the central and south sides of Chicago, thus eliminating local flooding and basement backups. The conveyance capacity of Bubbly Creek must be maintained so that additional flooding is not induced.
- Flow velocities during CSO events can reach high levels thus limiting the design of in-channel measures. Channel improvements, sediment capping, aquatic vegetation, and other restoration activities must be designed to withstand these flow velocities unless a separate conveyance for CSOs is developed.
- In many areas, development exists right up to the edge of the channel. Restoration efforts will be constrained in many locations mentioned above unless land titles or easements are purchased.
- Many properties surrounding Bubbly Creek either house current businesses or once did. Impacts to current businesses should be minimized where possible. Due to the historic nature of businesses along Bubbly Creek, a high potential for brownfield contamination exists and should be avoided where possible.
- The City of Chicago is currently in the process of developing an urban renewal plan for the neighborhood that surrounds Bubbly Creek. Project features should be planned in accordance with local land use and development plans.
- Numerous laws, regulations, Executive Orders, and policies must be considered, such as National Environmental Protection Act (NEPA), Endangered Species Act (ESA), Clean Water Act (CWA), Clean Air Act (CAA), National Historic Preservation Act (NHPA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and Corps of Engineers Planning and Engineering guidance.

h) Measures to Address Identified Planning Objectives:

A management measure is a feature or activity at a site, which addresses one or more of the planning objectives. A wide variety of measures were considered, some of which were found to be infeasible due to technical, economic or environmental constraints. Each measure was assessed and a determination made regarding whether it should be retained for future consideration in the formulation of alternative plans. The potential measures that were considered are listed in *Table 1* below.

Measure Description	Evaluation / Rationale for Decision	Decision
- Measures to improve normal flow conditions		
Separate sewers and collect stormwater from adjacent properties for controlled release during low-flow conditions	Numerous small sewersheds at one time drained directly into Bubbly Creek via the nine CSO outfalls currently along the channel. These sewersheds currently drain into interceptors and pumped for treatment. Due to the small size of these sewersheds, the possibility of sewer separation and collection of stormwater for controlled release exists.	retain
Take Bubbly Creek water in at RAPS for treatment at Stickney WRP	This measure was implemented during a two-year demonstration project by MWRDGC that concluded although water quality showed marked improvements this method cannot be used as a long term solution due to increased wet-weather capacity requirements at the WRP and significant additional operating costs.	not retained
Pumping water from the South Branch to the upstream end of Bubbly Creek near RAPS to restore low-flow conditions	The possibility of pumping water from the South Branch and discharging it at the upstream end of Bubbly Creek to restore low-flow conditions exists.	retain
Pumping water from Lake Michigan to the upstream end of Bubbly Creek near RAPS to restore low-flow conditions	A pump station at the lake and a tunnel along 39th street was constructed in the early 1900's and this measure was utilized for many years to flush raw sewage out of Bubbly Creek. This method was abandoned by the introduction of sewage treatment practices and the construction of RAPS to convey sewage to WRP. According to Section 1109(b)(4) of WRDA 1986 as amended, any Federal agency is prohibited from undertaking any studies that would involve the transfer of Great Lakes water for any purpose for use outside the Great Lakes basin, therefore this measure was not retained.	not retained
- Measures to reduce impacts of combined sewer overflows		
Separating sewers within the RAPS sewershed	During the comprehensive feasibility study that justified the Chicago Underflow Plan this measure was found too costly and infeasible.	not retained
Diverting stormwater within the RAPS sewershed to another sewershed	During the comprehensive feasibility study that justified the Chicago Underflow Plan this measure was found too costly and infeasible.	not retained
Local sewer separation and elimination of CSOs in areas adjacent to Bubbly Creek	As stated above, due to the small size of adjacent sewersheds, the possibility of sewer separation exists. In addition, CSO outfalls along the channel could possibly be bulkheaded or removed.	retain
Creation of detention storage for the RAPS sewershed	This measure was recommended and approved under the Chicago Underflow Plan. The McCook reservoir, currently under construction, along with the completed TARP tunnel system has created detention storage for large areas of the Chicago area including the RAPS sewershed. Additional storage in the RAPS sewershed is not feasible.	not retained
Creation of detention storage for areas adjacent to Bubbly Creek	As stated above, due to the small size of adjacent sewersheds, the possibility of creating additional detention storage exists.	retain
Water treatment/disinfectant of CSOs from RAPS	This measure would involve treatment of CSO discharges by such means as chlorination/dechlorination, filtration, ultraviolet disinfection, or other means. Due to the large volume of CSOs experienced at RAPS this measure is not feasible.	not retained
Water treatment/disinfectant of CSOs from areas adjacent to Bubbly Creek	As stated above, this measure would involve treatment of CSO discharges by a variety of means. Since CSO discharges from areas adjacent to Bubbly Creek are minimal in comparison to RAPS the possibility of treating the CSOs prior to contact with Bubbly creek exists.	retain
Bypass discharge directly to South Branch	The possibility of diverting CSO discharge from RAPS directly to the South Branch via diversion pipes exists. The large costs to implement this measure must be weighed against the ecological benefits from the elimination of CSOs from RAPS.	retain
- Measures to manage contamination from bottom sediments		
Remove contaminated sediments	The possibility of removing contaminated bottom sediments through dredging and disposal of Bubbly Creek exists.	retain
Cap existing sediments	The possibility of capping bottom sediments Bubbly Creek exists. The City of Chicago is currently pursuing a demonstration project to test the feasibility of capping sediments along Bubbly Creek.	retain

Table 1: Measures considered for further evaluation

Low-Flow Restoration, Combined Sewer Overflow Elimination, and Sediment Remediation with Ecosystem Restoration. This plan would consider measures to restore low flows to Bubbly Creek during normal periods, eliminate combined sewer overflow discharges and reduce contamination from bottom sediments along with the restoration of aquatic and terrestrial habitats. This ambitious plan would allow for complete restoration of Bubbly Creek to mimic a natural meandering stream with associate wetland margins. Low flow restoration would be accomplished in the same manner as the plans above, but to less of a scale since this plan involves significantly reducing the size of the stream channel. The amount of flow needed to maintain water quality would be less when channel size is reduced. Elimination of CSO discharge could be accomplished by diverting overflows directly to the South Branch via large pipes. An inlet manifold would be necessary at RAPS in order to direct flow into the diversion pipes. Other connections between adjacent CSOs along the channel, if not eliminated, and the diversion pipe may be required. At the downstream end, where discharges are reintroduced to the South Branch, an energy dissipating plunge pool would be necessary to control erosion. The diversion pipes could be placed in the existing channel in order to reduce excavation and land acquisition costs. Once CSOs are diverted from Bubbly Creek, complete ecosystem restoration would be possible. Since maintaining channel overflow conveyance capacity would be unnecessary, the cross-sectional area of the channel can be drastically reduced and reconfigured. The existing channel could be replaced with several wetland areas connected by a small meandered stream containing a series of riffle and pool complexes. The riparian area would also be drastically increased by reducing the width of the channel. Diverse aquatic and riparian habitats can be restored by this plan. Sediment remediation would be accomplished by capping and filling. Since bottom sediments can be capped with a thicker layer and substrate materials due to the removal of channel conveyance limitations and high channel velocities, sediment remediation under this plan is considered less complicated. A sketch of Bubbly Creek restored following this plan is shown in *Figure 6* below.

j) Conclusions from Preliminary Screening:

At this time, limited information is available at the reconnaissance level to screen alternatives. More in-depth conclusions for the preliminary screening will be drawn in the feasibility phase when more information is available for further analysis and alternatives have been reformulated and screened out. Due to funding and time constraints of the reconnaissance phase, only limited and informal coordination has been conducted with other agencies.

The preliminary screening indicates the plan that provides low flow restoration and sediment remediation with ecosystem restoration has the greatest potential for implementation. The low-flow restoration plan does not address other limiting factors caused by contamination from CSOs and bottom sediments leaving few opportunities for aquatic habitat restoration. Inclusion of a separate means of conveyance for CSOs to bypass Bubbly Creek as included in the low-flow restoration, combined sewer overflow elimination, and sediment remediation with ecosystem restoration is expected to be cost prohibitive. Benefits to ecosystem restoration would include increased habitat quantity

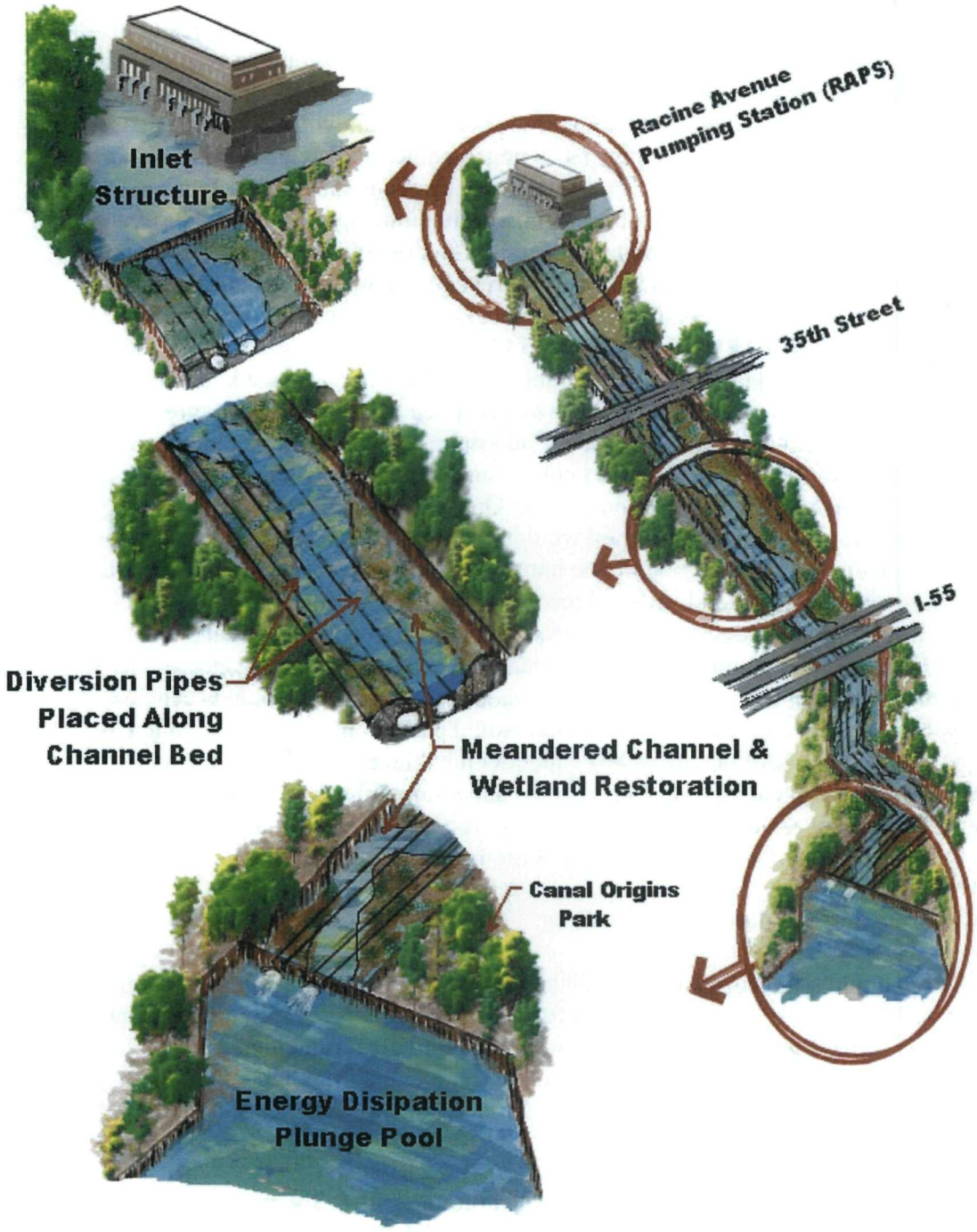


Figure 6: Low-Flow Restoration, Combined Sewer Overflow Elimination, and Sediment Remediation with Ecosystem Restoration Preliminary Plan

- Measures to improve water quality (in addition to other Measures that also address objective)		
In-stream aeration	The possibility of creating in-stream aeration to improve the water quality of Bubbly Creek exists. MWRDGC has constructed several sidestream elevated pool aeration (SEPA) stations along the Chicago Waterway System to improve water quality by lifting canal water and allowing it to drop over a series of weirs to create a waterfall and add oxygen to the waterway.	retain
Implementation of Best Management Practices (BMPs)	The possibility of implementing BMPs such as bioswales, bio-infiltration basins, and wetponds to divert clean stormwater into Bubbly Creek exists. The City of Chicago has established a 60-foot stormwater setback to allow implementation of stormwater BMPs along the channel.	retain
- Measures to restore aquatic and terrestrial habitats		
Reconfigure channel cross-sectional form	The possibility of reconfiguring the channel geometry to create flow diversity exists. Special attention in regards to sediment disturbance, handling, and disposal must be carefully considered with this measure.	retain
Streambank recontouring, native plantings, and restoration	The possibility of streambank restoration through recontouring and establishment of native plant communities exist.	retain
In-channel wetland restoration	The possibility of restoring wetlands within the channel exists. Current high flow conditions caused by CSOs from RAPS constrain the restoration of in-channel wetlands.	retain
Substrate introduction and streambed restoration	The possibility of restoring the natural substrate diversity exists. This measure could be incorporated with sediment removal or capping measures stated above.	retain
Placement of snags and large woody debris	The possibility of restoring natural structure diversity in the form of snags or large woody debris exists.	retain
Riparian native plant restoration	The possibility of restoring natural plant communities along the riparian areas of Bubbly Creek exists.	retain
- Measures to improve river corridor aesthetics (in addition to other Measures that also address objective)		
Screen floatable debris from channel	The possibility of screening and removing floatable debris introduced by CSO discharges into Bubbly Creek exists.	retain
Repair or replace deteriorated bank treatments	Due to the ecosystem restoration authority of this project, repair or replacement of existing deteriorated bank treatments such as steel sheet pile and concrete walls is not considered appropriate. Measures to restore streambanks through recontouring and native plant restoration as stated above are recommended.	not retained
- Measures to provide additional recreational opportunities		
Small boat and canoe launch	The possibility of providing compatible water access points to Bubbly Creek in the form of a small boat and canoe launch exists.	retain
River access walking trail	The possibility of providing compatible recreational opportunities through walking trails along the banks of Bubbly Creek exists.	retain
Interpretive signage	The possibility of providing compatible recreational opportunities by constructing interpretive displays featuring the rich history of Bubbly Creek and surrounding areas and the urban restoration initiatives currently underway.	retain

Table 1: Measures considered for further evaluation (continued)

i) Preliminary Plans for further consideration:

Preliminary plans are formulated by combining the various retained measures that meet the objectives of the study. During the feasibility study these plans will be evaluated and the most cost effective and best-buy plans will be developed in further detail. Preliminary plans include:

No action. The Corps is required to consider the option of "No Action" as one of the alternatives. No Action assumes that no project would be implemented by the Federal Government (Corps of Engineers) to achieve the planning objectives. No Action, which is synonymous with the "Without Project Condition", forms the basis from which all other alternative plans are measured.

Low-Flow Restoration. This plan would consider measures to restore low flows to Bubbly Creek during normal and dry weather periods. The restoration of low flows could be accomplished by pumping water from the South Branch and introducing that flow to the upstream end of Bubbly Creek near RAPS. The introduction of low flows would improve water quality, a limiting factor in the restoration of the Bubbly Creek ecosystem, as shown by the demonstration projects performed by MWRDGC. Without addressing the other limiting factors, few opportunities for aquatic habitat restoration would exist due to contamination by CSO and bottom sediments. Major aesthetic improvements can be achieved by reducing the amount of floatable debris that collects within the channel and by reducing foul odors that stagnant waters now produce.

Low-Flow Restoration and Sediment Remediation with Ecosystem Restoration. This plan would consider measures to restore low flows to Bubbly Creek during normal periods and reduce contamination from bottom sediments along with the restoration of aquatic and associated habitats. Low flow restoration would be accomplished in the same manner as the plan above. Sediment remediation measures for consideration include removal and capping. Since anaerobic decomposition of the bottom sediments produce large amounts of gas and high velocities occur in the channel during overflows, challenges exist with sediment capping at this site. Field demonstrations are recommended to assist or provide valuable information in the selection of capping materials, placement methods, and gas collection and treatment systems. Alterations to channel cross sections could be configured to allow for areas of low velocities that could sustain aquatic vegetation necessary for ecosystem restoration. Major alterations to the channel could include reconfiguring the channel to mimic natural streams where deeper portions of the channel provide the main flow conveyance, while shallow edges and floodplain areas provide calmer waters for fish spawning, rearing, and feeding. Stream bank alterations including riparian habitat restoration along with river access points, trails, and other recreational features could be part of the channel alterations. A rendering of Bubbly Creek restored following this plan is shown in *Figure 5* below.

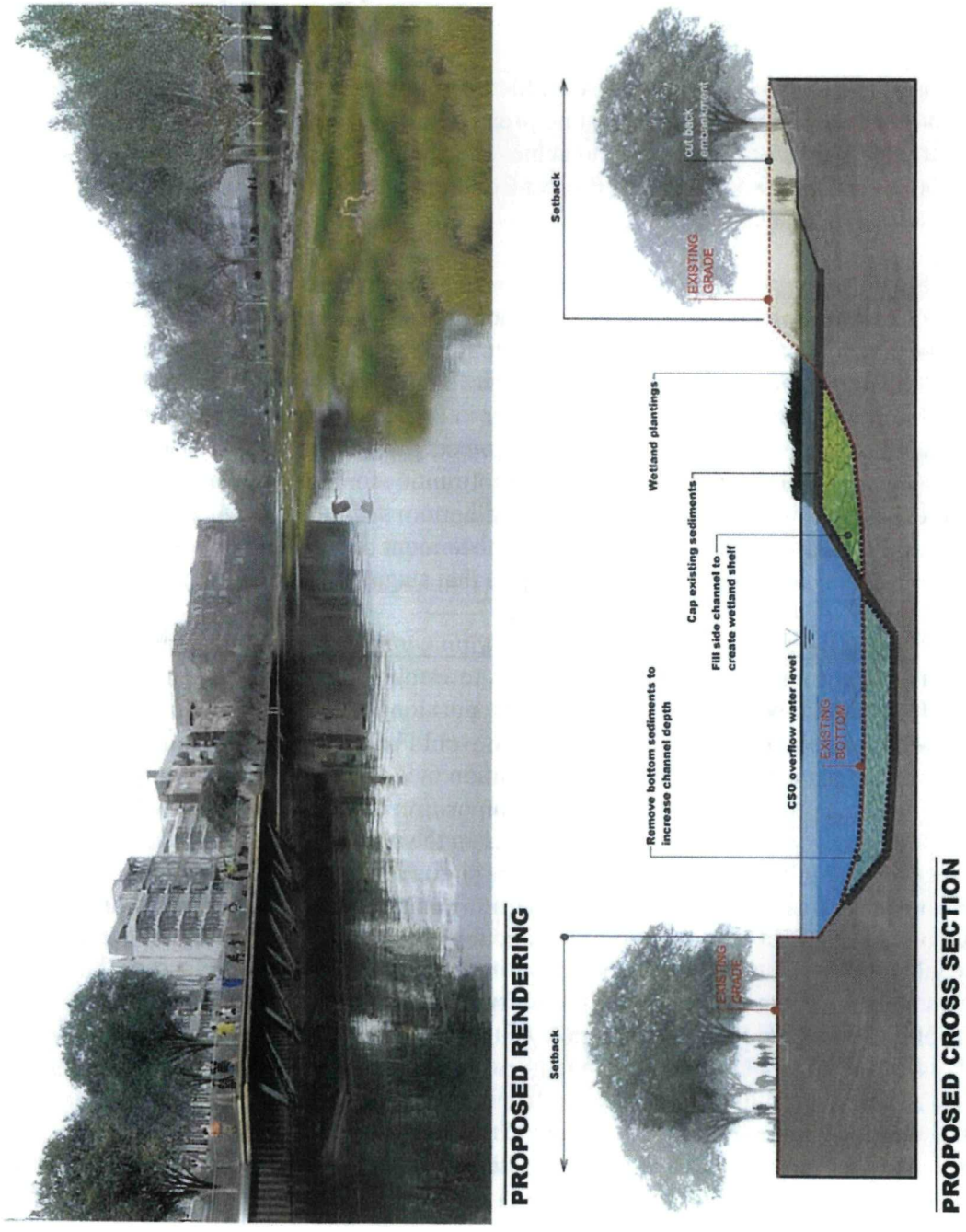


Figure 5: Low-Flow Restoration and Sediment Remediation with Ecosystem Restoration Preliminary Plan (figure provided by Chicago Department of Planning and Development)

and improved habitat quality of a significant area of metropolitan Chicago which would benefit millions of local area residents. Ecosystem restoration benefits would likely be quantified in terms of increases in the quantity and quality of lotic stream, riparian, and wetland habitats. The restoration of Bubbly Creek would provide a source for aquatic plants and animals and benefit an area several miles upstream and downstream of the project area. Currently, very few locations for native aquatic species to reproduce exist, thus severely impairing the abundance within the Chicago River System. Because the entire area that would be considered for restoration is currently highly degraded and has extremely low habitat value, improvements in habitat quality due to restoration could be very high. A preliminary table of potential ecological outputs as related to quality and function of with and without project habitats is shown in *Table 2* below. These numbers are based solely on professional judgment and should only be used as a relative guide in displaying restoration potential for Bubbly Creek. Actual restoration outputs will be determined during the feasibility study based on measured data and sound scientific methodology.

	Habitat Type	Area of Habitat (acres)	Quality of Habitat (1-5)	Function of Habitat (0-10)	Ecological Output (HUs)
Without Project / No Action	Lotic[1]	25	1	1	25
	Riparian[2]	21	1	3	63
	Wetland	0	0	0	0
	Total	*46*			*88*
				Net Improvement:	**0**
Low-Flow Restoration	Lotic	25	2	3	150
	Riparian	21	1	3	63
	Wetland	0	0	0	0
	Total	*46*			*213*
				Net Improvement:	**125**
Low-Flow, Sediment Remediation, Ecosystem Restoration	Lotic	20	3	6	360
	Riparian	21	4	8	672
	Wetland	15	3	6	270
	Total	*56*			*1,302*
				Net Improvement:	**1,214**
Low-Flow Rest., CSO Elimination, Sed. Remed., Eco. Rest.	Lotic	10	4	8	320
	Riparian	21	4	8	672
	Wetland	25	4	8	800
	Total	*56*			*1,792*
				Net Improvement:	**1,704**

[1] Lotic stream length of 6,600 linear feet and an average channel width of 165-feet was used to calculate habitat footprint area

[2] Riparian length of 15,000 linear feet and a setback width of 60-feet used to calculate habitat footprint area

Table 2: Estimated Ecological Outputs of Preliminary Restoration Plans

Preliminary implementation costs have been developed based on other ecosystem restoration projects in the area and professional judgment. Since the causes of degradation facing Bubbly Creek are quite unique, complex solutions are necessary for restoration. Many unit cost values from other projects were not available for use because some technologies proposed for Bubbly Creek are new and have not been implemented elsewhere. For example, sediment capping costs can vary greatly depending on the materials used and thickness required for this application. The preliminary implementation costs as shown in *Table 3* below are meant to provide a relative basis for comparison only. A detailed and more reliable cost estimate will be developed during the feasibility phase.

Plan	Construction Activity	Cost (x $1,000)
Low-Flow Restoration	Low Flow Restoration (Pump, Conveyance Pipe, and Inlet/Outlet Structures)	2,500
	Sub-Total	2,500
	Contingency (25%)	625
	Estimated Total Construction	**3,125**
Low-Flow Restoration, Sediment Remediation, and Ecosystem Restoration	Low Flow Restoration (Pump, Conveyance Pipe, and Inlet/Outlet Structures)	2,500
	Sediment Capping	15,000
	Limited Sediment Dredging and Disposal	2,000
	Riparian Site Prep and Earthwork	1,500
	Riparian and Wetland Vegetation	3,000
	Sub-Total	24,000
	Contingency (25%)	6,000
	Estimated Total Construction	**30,000**
Low-Flow Restoration, CSO Elimination, Sediment Remediation, and Ecosystem Restoration	Low Flow Restoration (Pump, Conveyance Pipe, and Inlet/Outlet Structures)	1,500
	CSO Diversion Structures (Channel Diversion Pipes and Inlet/Outlet Structures)	84,000
	Sediment Capping and Meander Channel Construction	10,000
	Riparian Site Prep and Earthwork	1,500
	Riparian and Wetland Vegetation	3,000
	Sub-Total	100,000
	Contingency (25%)	25,000
	Estimated Total Construction	**125,000**

Table 3: Estimated Construction Costs of Preliminary Restoration Plans

k) Project Significance:

Statements of significance provide qualitative information and help decision makers evaluate whether the value of the resources restored are worth the costs necessary to restore them. The Bubbly Creek ecosystem restoration project will provide substantial benefits of local, regional, and national significance. The significance of restoration outputs are recognized in terms of institutional, public, and/or technical importance as discussed below.

Institutional Recognition – The Bubbly Creek ecosystem restoration project is significant based on institutional recognition meaning that the importance of the environmental resource is acknowledged in the laws, adopted plans, and other policy statements of public agencies, tribes, or private groups as listed below:

- *Fish and Wildlife Conservation Act of 1958, as amended* - All Federal departments and agencies to the extent practicable and consistent with the agencies authorities should conserve and promote conservation of non-game fish and wildlife. The Bubbly Creek project will help conserve Chicago River ecosystems including the non-game fish and wildlife within the existing authorities of the Corps of Engineers.

- *National Environmental Policy Act of 1969, as amended* – It is national policy to promote efforts, which will prevent or eliminate damage to the environment. The Bubbly Creek project will restore damaged aquatic habitat and enhance the public use of the natural resource.

- *North American Wetlands Conservation Act of 1968, as amended* - Provides for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, U.S. and Mexico. The Chicago River and Bubbly Creek are along the Illinois River segment of the Mississippi River migratory bird flyway. Over 300 species of birds migrate through these river valleys in spring and fall and is used by more than 40 percent of the migratory waterfowl traversing the United States and 60 percent of all bird species in North America. The proposed project will increase and restore wetland and riparian habitats that are used by migratory birds along the flyway.

- *National Historic Preservation Act of 1966, as amended* - Preservation of significant historical features (buildings, objects and sites) through grants and establishment of the National Register of Historic Places. Two historic landmarks are located within the project area. The Old Stone Gate of Chicago Union Stockyards, which is the last remaining feature of the Union Stockyards, is listed on the National Register and the Canal Origins Park located at the mouth of Bubbly Creek is the site where the I&M Canal began and is designated as a Chicago landmark. The Bubbly Creek project would help to restore areas adjacent to historic landmarks, thus aiding in cultural heritage of the area.

- *Illinois and Michigan Canal National Heritage Corridor Act of 1984, as amended* - Creation of the nation's first national heritage area, the I&M National Heritage Corridor has goals of preservation, conservation, recreation, and economic development. The Bubbly Creek project falls within the corridor and would help to restore and preserve the area in concert with national heritage goals.

- *Executive Order 11514: Protection and Enhancement of Environmental Quality* - Federal policy aimed at protecting and enhancing the quality of the Nation's environment. The Bubbly Creek project will restore a polluted and stagnant section of the Chicago River System.

- *Executive Order 11593: Protection and Enhancement of the Cultural Environment* - Federal policy aimed at preserving, restoring and maintaining the historic and cultural environment of the Nation. The Bubbly Creek project will help restore an area rich in historic and cultural significance. As stated above, the project area is the site of the Union Stockyards, origin of the I&M canal, and falls within the I&M Canal National Heritage Corridor.

- *Executive Order 12962: Recreational Fisheries* - Federal policy aimed to conserve, restore, and enhance aquatic ecosystems to provide for increased recreational fishing opportunities nationwide. The Bubbly Creek project will enhance the local fisheries by providing spawning and foraging habitat for yellow perch, large mouth bass, sunfishes and other various non-game species.

- *Memorandum of Understanding: Urban Rivers Restoration Initiative* - The purpose of the URRI is meant to facilitate collaborative efforts between government agencies, states and stakeholders to improve water quality and habitat of degraded urban rivers. The agreement was signed between the USEPA and USACE. The Chicago Area Rivers Restoration Initiative (CARRI) was nominated for national pilot status. Bubbly Creek and the Chicago River Corridor Development plan are specifically mentioned in CARRI.

- *City of Chicago: Chicago River Corridor Development Plan* - The Chicago River Corridor Development Plan is the result of a collaborative effort among government agencies, private sector developers, and non-profit organizations to create a blueprint for the future of the Chicago River. Approved by the Chicago Plan Commission in 1998, the plan sets forth a shared vision for the river and outlines specific recommendations to be completed over the next 10 years. The Bubbly Creek project supports the goals of the plan to enhance the river's attractiveness as a natural and recreational resource.

- *Friends of the Chicago River: Clean Water Campaign* - The Clean Water Campaign has the goal of developing a strategy for how to improve the water quality of the Chicago River to the highest possible standard. Improving water quality has the biggest impact on the overall health of the Chicago River. Without clean water, the establishment of healthy wildlife populations and the potential of

the Chicago River for recreation will not be realized. The Bubbly Creek project supports the Clean Water Campaign by improving water quality and restoring natural aquatic and related habitats.

- *City of Chicago: Bubbly Creek Vision Plan* - The Bubbly Creek Vision Plan, which is currently being developed by the City of Chicago and the Bridgeport neighborhood, aims at creating a development and restoration plan for the neighborhood surrounding and including Bubbly Creek. The Bubbly Creek project is the cornerstone of this plan.

Public Recognition – The Bubbly Creek ecosystem restoration project is significant based on public recognition meaning a segment of the general public recognizes the importance of an environmental resource, as evidenced by people engaged in activities that reflect an interest or concern for that particular resource as listed below:

- The Bubbly Creek project is locally significant for its ecological value to the City of Chicago and surrounding neighborhoods. Bubbly Creek is located within a heavily populated area of metropolitan Chicago. Based on 2000 U.S. Census data, over 104 thousand people live within 1 mile of the project area that would directly benefit from the proposed project. Additionally, over 1.4 million people live within 5 miles of Bubbly Creek that would benefit from additional natural space, which is severely lacking in this area.

- The Friends of the Chicago River (FCR) is the only organization solely dedicated to the Chicago River. Since 1979, FCR has been working to improve the health of the Chicago River for the benefit of people and wildlife and by doing so, has laid the foundation for the river to be a beautiful, continuous, easily accessible corridor of open space in Metropolitan Chicago. FCR has conducted numerous river rescue days and other activities that benefit the Chicago River. FCR are solely funded by private donations and have been actively involved in the Bubbly Creek project and will continue to provide support during the feasibility study.

- The Chicago River Rowing and Paddling Club (CRRPC) is the oldest boat club on the Chicago River. Founded in 1979, CRRPC has pioneered recreational use of the Chicago River by demonstrating and promoting the potential of the river for canoeing, rowing and kayaking. CRRPC currently maintains a canoe launch at the mouth of Bubbly Creek and supports the Bubbly Creek project and will be involved in formulating compatible water access and recreational opportunities.

Technical Recognition – The Bubbly Creek ecosystem restoration project is significant based on technical recognition. This means the resource qualifies as significant based on its "technical" merits, which are based on scientific knowledge or judgment of critical resource characteristics as listed below:

- Scarcity - The Bubbly Creek project would restore in-stream habitat, side stream wetlands, and naturalized hydraulic regimes, which are extremely rare within the Chicago River system.

- Representation - The Bubbly Creek project aims to restore stream and wetland features that are representative of what was present nearly 200 years ago. The project area was once comprised of a series of sluggishly flowing channels and connected wetlands.

- Connectivity – The restoration of Bubbly Creek would begin the process of reconnecting sustainable habitats within the Chicago River. Habitats restored with this project would connect with other ecosystem restoration projects currently being developed within the Chicago River system.

- Status and Trends - Bubbly Creek has been severely altered by human intervention, which has caused serious degradation to the ecosystem. Without intervention, the project area will remain in an imperiled state. The Bubbly Creek project has the ability to recover and restore this unique and important resource.

- Limiting Habitat - Bubbly Creek is currently devoid of any natural habitat. This project would restore in-stream habitat, side stream wetlands, and native riparian plant communities, which are currently extirpated from the project area.

- Biodiversity - The Bubbly Creek restoration project would significantly increase the biodiversity of flora and fauna within the project area. The project will increase the biodiversity of macroinvertebrate, fish, and bird species. Restoration of Bubbly Creek would provide a natural area to allow for fish species to spawn and disperse throughout the Chicago River system, which is currently devoid of quality spawning habitat. This project will also increase the biodiversity and abundance of fish outside the project area within the Chicago River system.

In summary, the proposed Bubbly Creek ecosystem restoration project is significant in terms of institutional, public, and technical recognition. The significance and high value of the resources to be restored lay the foundation for Federal interest in conducting a feasibility study.

l) Establishment of a Plan Formulation Rationale:

The Corps is required to consider the option of "No Action" as one of the alternatives in order to comply with the requirements of the National Environmental Policy Act (NEPA). No Action assumes that no project would be implemented by the Federal Government (Corps of Engineers) to achieve the planning objectives. No Action, which is synonymous with the "Without Project Condition", forms the basis from which all other alternative plans are measured.

The conclusions from the preliminary screening form the basis for the next iteration of the planning steps that will be conducted in the feasibility phase. The likely array of alternatives that will be considered in the next iteration includes: no action; pumping from South Branch to provide low-flow restoration; low-flow restoration along with sediment capping with channel, wetland, and riparian restoration; low-flow restoration along with combined sewer overflow diversion, sediment remediation by capping and filling with channel remeandering, wetland, and riparian restoration; and locally-developed plans. Future screening and reformulation will be based on the following factors: priorities of the non-Federal sponsor regarding project purposes; input from stakeholders including landowners, interest groups and other government agencies. during the public scoping process for the feasibility phase; and the results of detailed investigations conducted during the feasibility phase.

6. FEDERAL INTEREST:

Since ecosystem restoration is a high priority budget output and the primary outputs of the alternatives are ecosystem restoration, there is strong Federal interest in conducting a feasibility study. Based on preliminary information, there are potential project alternatives that would be consistent with current Corps policies regarding costs, benefits, and environmental impacts. There are opportunities within the study area to develop a cost effective environmentally justified project that would achieve well-integrated ecosystem restoration within a complicated system and provide limited compatible recreation to the extent possible within an area that could directly benefit millions of local area residents.

7. PRELIMINARY FINANCIAL ANALYSIS:

As the potential non-Federal sponsor, the City of Chicago Department of Environment (DOE) would be required to provide 50 percent of the cost of the feasibility phase. DOE is also aware of the cost sharing requirements for potential project implementation. A letter of intent from DOE stating a willingness to pursue the feasibility study and to share in its costs is included as Enclosure A.

8. SUMMARY OF FEASIBILITY STUDY ASSUMPTIONS:

a) Feasibility Phase Assumptions:

- The without-project conditions serve as the baseline for estimating and evaluating the beneficial and adverse effects of a potential water resource project. Since the Bubbly Creek watershed is fully developed and the future without project condition can be reasonably predicted with confidence, the planning period for the environmental analysis will be over a 50-year period.

- The feasibility study will address a project that is complete in itself and does not rely on and dependent upon other projects for justification. Other ecosystem restoration projects within the area will provide additional environmental outputs.
- An MCACES cost estimate will be performed on the selected plan providing and analysis suitable for a feasibility level study.
- The feasibility study will contain ecosystem restoration outputs as the basis for justification and will not contained a detailed economic analysis. Incidental economic benefits maybe included.
- Additional and expanded assumptions may be identified during development of the project management plan (PMP). Any critical assumptions and sensitive policy areas will be coordinated with Corps vertical team.

b) Policy Exceptions and Streamlining Initiatives:

The study will be conducted in accordance with the Principles and Guidelines and Corps of Engineers regulations. No exceptions to established guidance have been identified at this time.

c) Other Approvals Required:

The non-Federal Sponsor will need to have the necessary funding and authority to participate in the feasibility phase.

9. FEASIBILITY PHASE MILESTONES:

The feasibility phase schedule will be developed in detail during the preparation of the Project Management Plan (PMP) and the Feasibility Cost Sharing Agreement (FCSA). The feasibility study is expected to be conducted over a 36-month period. A preliminary schedule of the major feasibility study milestones has been provided in *Table 4*.

Milestone	Description	Duration (mo)	Cumulative (mo)
Milestone F1	Initiate Study	0	0
Milestone F2	Public Workshop and NEPA Scoping	2	2
Milestone F3	Feasibility Scoping Meeting	11	13
Milestone F4	Alternative Formulation Briefing	14	27
Milestone F5	Draft Feasibility Report and EA or EIS	3	30
Milestone F6	Final Public Meeting	1	31
Milestone F7	Feasibility Review Conference	1	32
Milestone F8	Final Report to LRD	3	35
Milestone F9	DE's Public Notice	1	36
-	Chief's Report	4	40
-	Project Authorization	4	44

Table 4: Preliminary Feasibility Phase Milestones

10. FEASIBILITY PHASE COST ESTIMATE:

The following feasibility phase cost estimate, as shown in *Table 5*, is preliminary pending negotiation of a detailed scope of work for the feasibility study with the local sponsor. A revised cost estimate will be presented in the Project Management Plan.

Feasibility Study Task Description	Cost
Surveys and Mapping except Real Estate	$100,000
Hydrology and Hydraulics Studies/Report	$100,000
Geotechnical Studies/Report	$150,000
Engineering and Design Analysis Report	$250,000
Socioeconomics Studies	$25,000
Real Estate Analysis/Report	$50,000
Environmental Studies/Report (Except USF&WL)	$200,000
Fish and Wildlife Coordination Act Report	$50,000
HTRW Studies/Report	$100,000
Cultural Resources Studies/Report	$50,000
Cost Estimates	$75,000
Public Involvement Documents	$75,000
Plan Formulation and Evaluation	$250,000
Final Report Documentation	$50,000
Technical Review Documents	$100,000
Washington Level Report Approval (Review Support)	$75,000
Management and Budget Documents	$200,000
Contingencies	$500,000
Project Management Plan (PMP)	$50,000
PED Cost Sharing Agreement	$50,000
TOTAL:	$2,500,000

Table 5: Preliminary Feasibility Phase Cost Estimate

11. VIEWS OF OTHER RESOURCE AGENCIES:

This project contributes to a multi-agency regional watershed plan. The Urban River Restoration Initiative is a partnership between Federal, State, and local agencies in a collaborative effort to improve water quality, manage contaminated sediment, and restore habitat in the Chicago Area Rivers. The partnership is working to achieve common goals of protecting public health, restoring habitat and revitalizing economic development. In addition, this Bubbly Creek study is a high priority for the City of Chicago and the Mayor's Office, and supports the Friends of the Chicago River biodiversity recovery plan.

12. POTENTIAL ISSUES AFFECTING INITIATION OF FEASIBILITY PHASE:

Continuation of this study into the cost-shared feasibility phase is contingent upon an executed Feasibility Cost Sharing Agreement (FCSA). Issues that could impact the initiation of the feasibility phase include the lack of funds by the Federal government. The City of Chicago Department of Environment provided a letter dated August 1, 2006, as attached, noting their intention to be a local sponsor and willingness to enter into a feasibility cost sharing agreement.

The tentative schedule for signing the FCSA is July 2007. Based on the schedule of milestones laid out in Section 9 above; completion of the feasibility report would be in August 2010, with a potential Congressional Authorization in WRDA 2012.

13. PROJECT AREA MAP:

A map of the study area is provided as Figure 1.

14. RECOMMENDATIONS:

It is recommended that this 905(b) Preliminary Analysis report be approved as a basis for developing the Project Management Plan (PMP) for the Bubbly Creek feasibility study, finalizing the Feasibility Cost Sharing Agreement (FCSA) with the non-Federal sponsor, and proceeding with more detailed planning and engineering study to determine an appropriate, coordinated, implementable solution to the identified water resources problems and opportunities.

25 Aug 06
Date

John D. Drolet
Colonel, Corps of Engineers
District Engineer

City of Chicago
Richard M. Daley, Mayor

Department of Environment

Sadhu A. Johnston
Commissioner

Twenty-fifth Floor
30 North LaSalle Street
Chicago, Illinois 60602-2575
(312) 744-7606 (Voice)
(312) 744-6451 (FAX)
(312) 744-3586 (TTY)
http://www.cityofchicago.org

August 1, 2006

John D. Drolet
Colonel, U.S. Army
District Commander
111 N. Canal Street, Suite 600
Chicago, IL 60606-7206

SUBJECT: Bubbly Creek Feasibility Study – Letter of Intent

Dear Colonel Drolet:

The U.S. Army Corps of Engineers, Chicago District is currently conducting a reconnaissance study of the South Fork of the South Branch of the Chicago River. The primary focus of the study is ecosystem restoration. We have met several times with representatives of the Chicago District to discuss this study.

Overall, water quality in the Chicago River has been improving and land along the river is currently being redeveloped. Several activities are currently underway or planned to improve the water quality. However, additional work is needed to improve nuisance conditions caused by sewer overflows, to restore habitat, and to continue to improve general appearance and water quality which is jeopardized by a century of slaughter house pollution resting on the creek bottom. Ecosystem restoration will improve water quality, protect public health, restore habitat and revitalize economic development.

We understand that participation by the Corps of Engineers to conduct a more detailed feasibility study of the SFSB of the Chicago River requires a local sponsor capable and willing to enter into a feasibility cost sharing agreement. Our understanding is that under current regulations, cost sharing of the study is 50% federal and 50% local. By this letter, the City of Chicago intends to be a local sponsor for this ecosystem restoration feasibility study project.

We look forward to working with the Army Corps on this important project. If you have any questions, please call Renante Marante at 312 742-0123.

Sincerely,

Sadhu A. Johnston (KS)

Sadhu A. Johnston
Commissioner
Chicago Department of Environment

cc: Cathy Hudzik (M.O.)
Kirston Buczak (A.C.O.E.)
David Bucaro (A.C.O.E.)

NEIGHBORHOODS
BUILDING CHICAGO TOGETHER

CHICAGO WORKS TOGETHER

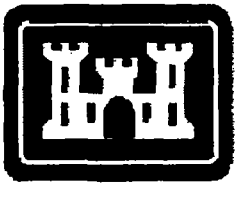
PMP

PROJECT MANAGEMENT PLAN

BUBBLY CREEK, SOUTH BRANCH OF THE CHICAGO RIVER, ILLINOIS

FEASIBILITY STUDY

Prepared By:



U.S. Army Corps of Engineers
Chicago District

August 2007

By approving this document, the undersigned project delivery team members agree to follow the provisions of this Project Management Plan for the Bubbly Creek, South Branch of the Chicago River Feasibility Study. Each activity will focus its efforts to provide complete comprehensive planning and to meet U.S. Army quality, safety and reliability expectations, with minimum changes, within budget, and within schedule. Changes to this plan must be coordinated with the undersigned. Signature of this Project Management Plan does not financially obligate the U.S. Government or the City of Chicago.

U.S. Army Corps of Engineers – Chicago District

David F. Bucaro, P.E.
Study Manager / Plan Formulation

CPT Kelsey W. Lavicka
Project Manager

Frank M. Veraldi
Environmental Resources

Keith G. Ryder
Cultural & Social Resources

Casey L. Pittman
Environmental Engineering

David L. Kiel
Hydrology & Hydraulic Engineering

William A. Rochford, P.E.
Geotechnical Engineering

Satch Damaraju
Cost Engineering

Ronald O. Wietecha
Office of Counsel

Steven J. Hughes
Detroit District Real Estate

Robert C Vanoer
Civil Design Engineering

City of Chicago

Renante U. Marante
Chicago Department of Environment

Nelson Chueng, AICP
Chicago Department of Planning & Development

Cathy M. Hudzik
City of Chicago Office of the Mayor

The undersigned office chiefs of the Chicago and Detroit Districts, U.S. Army Corps of Engineers have reviewed and endorse this Project Management Plan for the Bubbly Creek, South Branch of the Chicago River Feasibility Study, as developed by the Product Delivery Team.

Susanne J. Davis, P.E. Date
Chief, Planning Branch

Sherrie K Barham Date
Chief, Programs & Project Mgmt. Branch

Linda M. Sorn, P.E. Date
Chief, Technical Services Division

Joseph J. Schmidt, P.E. Date
Chief, Design Branch

for Victor L. Kotwicki Date
Chief, Detroit Real Estate Division

Regina G. Blair Date
Chief, Contracting Branch

for Sanford A. Solomon Date
Chief, Chicago District Counsel

The staffs of the Chicago and Detroit Districts, U.S. Army Corps of Engineers, and the City of Chicago have reviewed this Project Management Plan for the Bubbly Creek, South Branch of the Chicago River Feasibility Study, as developed by the Product Delivery Team. As representatives of the U.S. Army Corps of Engineers and the City of Chicago, we hereby approve this document, which serves as the basis for the Feasibility Cost Sharing Agreement.

Roy J. Deda, P.E. Date
Chief, Planning & Project Mgmt Division

Sadhu A. Johnston Date
Commissioner, Chicago Department of Environment

BUBBLY CREEK,
SOUTH BRANCH OF THE CHICAGO RIVER
FEASIBILITY STUDY

PROJECT MANAGEMENT PLAN

August 2007

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BUBBLY CREEK,
SOUTH BRANCH OF THE CHICAGO RIVER
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I. PURPOSE OF MANAGEMENT PLAN

The project management plan for the Bubbly Creek, South Branch of the Chicago River Feasibility Study, herein after referred to as the PMP, was developed in accordance with Engineering Regulation (ER) 1105-2-100, Planning Guidance and Engineering Circular (EC) 1105-2-208, Preparation and Use of Project Study Plans. The Chicago District of the U.S. Army Corps of Engineers (USACE) developed this PMP in conjunction with the prospective non-Federal sponsor, the City of Chicago. The PMP serves four major functions throughout the feasibility study phase as defined below:

a. The PMP is an attachment to the Feasibility Cost Sharing Agreement (FCSA), which defines the planning approach, activities to be accomplished, schedule, and associated costs that the Federal Government and the non-Federal sponsor(s) will be supporting financially. The PMP, therefore defines a contract between the Corps and the non-Federal sponsor(s), and reflects a "buy in" on the part of the financial backers, as well as those who will be performing, and reviewing, the activities involved in the feasibility study. The PMP describes the initial tasks of the feasibility phase, continues through the preparation of the final feasibility report, the project management plan for project implementation and design agreement, and concludes with support during the Washington-level review of the final feasibility report.

b. The PMP is a basis for change. Because planning is an iterative process without a predetermined outcome, more or less costs and time may be required to accomplish reformulation and evaluations of the alternatives. Changes in scope will occur as the technical picture unfolds. With clear descriptions of the scopes and assumptions outlined in the PMP, deviations are easier to identify. The impact in either time or money is easily assessed and decisions can be made on how to proceed. The PMP provides a basis for change.

c. The PMP is a basis for the review and evaluation of the feasibility report. Since the PMP represents a contract among study participants, it will be used as the basis to determine if the draft feasibility report has been developed in accordance with established procedures and previous agreements. The PMP reflects mutual agreements of the district, division, non-Federal sponsor(s) and HQUSACE into the scope, critical assumptions, methodologies, and level of detail for the studies that are to be conducted during the feasibility study. Review of the draft report will be to insure that the study has been developed consistent with these agreements. The objective is to provide early assurance that the project is developed in a way that can be supported by higher headquarters.

d. The PMP is a study management tool. It includes scopes of work that are used for funds allocation by the project manager. It forms the basis for identifying commitments to the non-Federal sponsor(s) and serves as a basis for performance measurement.

II. RECONNAISSANCE OVERVIEW

The reconnaissance study and Section 905(b) Analysis are components of the reconnaissance phase. The purpose of the reconnaissance phase is to accomplish the following six essential tasks:

(1) Determine if the water resource problem(s) warrant Federal participation in feasibility studies. Defer comprehensive review of other problems and opportunities to feasibility studies;

(2) Define the Federal interest based on a preliminary appraisal consistent with Army policies, costs, benefits, and environmental impacts of identified potential project alternatives;

(3) Complete a 905(b) Analysis (Reconnaissance Report);

(4) Prepare a Project Management Plan (PMP);

(5) Assess the level of interest and support of non-Federal entities in the identified potential solutions and cost-sharing of feasibility phase and construction. A letter of intent from the non-Federal sponsor(s) stating the willingness to pursue the cost shared feasibility study described in the PMP and to share in the costs of construction is required; and

(6) Negotiate and execute a Feasibility Cost Sharing Agreement (FCSA).

The Reconnaissance Report identified both Federal and non-Federal interests in implementing an ecosystem restoration project and recommended continuation to the Feasibility Phase. Ecosystem restoration projects are defined as high priority outputs in the Administration's budget policy. Within the Civil Works program, priority is given to restoration projects that restore degraded ecosystem structures and functions, including the ecosystem's hydrology, plant and animal communities, to a less degraded condition. The principal problems impeding the restoration of aquatic and associated fish and wildlife habitat in Bubbly Creek are severe hydrologic alterations, contaminated sediments, poor water quality, and other impacts upon the system caused by human activity. Alleviating these problems within the watershed is a critical need that is within the Federal interest and appropriate for Corps of Engineers involvement.

A. STUDY AUTHORITY:

This study is being conducted in accordance with the study resolution adopted by the Committee on Environment and Public Works, United States Senate, July 20, 2005. The study resolution authority reads as follows:

> *"Resolved by the Committee on Environment and Public Works of the United States Senate, that, the Secretary of the Army, is requested to review the report of the Chief of Engineers on the Illinois River, Illinois submitted in Senate Document Numbered 126, Seventy-first Congress, second session, and other pertinent reports, to determine whether any modifications to the South Fork of the South Branch of the Chicago River (commonly known as Bubbly Creek) for ecosystem restoration is advisable at this time."*

Funds in the amount of $200,000 were appropriated by Congress in Fiscal Year 2006 to conduct the reconnaissance phase of the study. Any remaining funds will be carried over to FY07 to initiate feasibility once approval is received.

B. STUDY AREA:

The study area includes the entire 1.25 mile channel and areas draining to the South Fork of the South Branch of the Chicago River, colloquially referred to as "Bubbly Creek" located entirely within the City of Chicago, Cook County, Illinois. A once sluggishly flowing channel that drained an area of 5 square miles of wetlands has since been severely altered by human development. Bubbly Creek was once a pristine wetland system that provided natural aquatic and terrestrial habitats for fish, bird, and mammal species. Bubbly Creek has endured major physical alterations including deepening and widening of the channel, creation of sheet pile banks, complete filling of wetlands within the original drainage area, severe hydrologic alterations including a major increase in drainage area, and introduction of polluted sediments and runoff. Today, the Bubbly Creek channel drains a 30 square mile area of metropolitan Chicago, begins near Racine Avenue and 38th Street at the Racine Avenue Pumping Station (RAPS), and flows north into the South Branch of the Chicago River near Ashland Avenue as shown in *Figure 1* below.

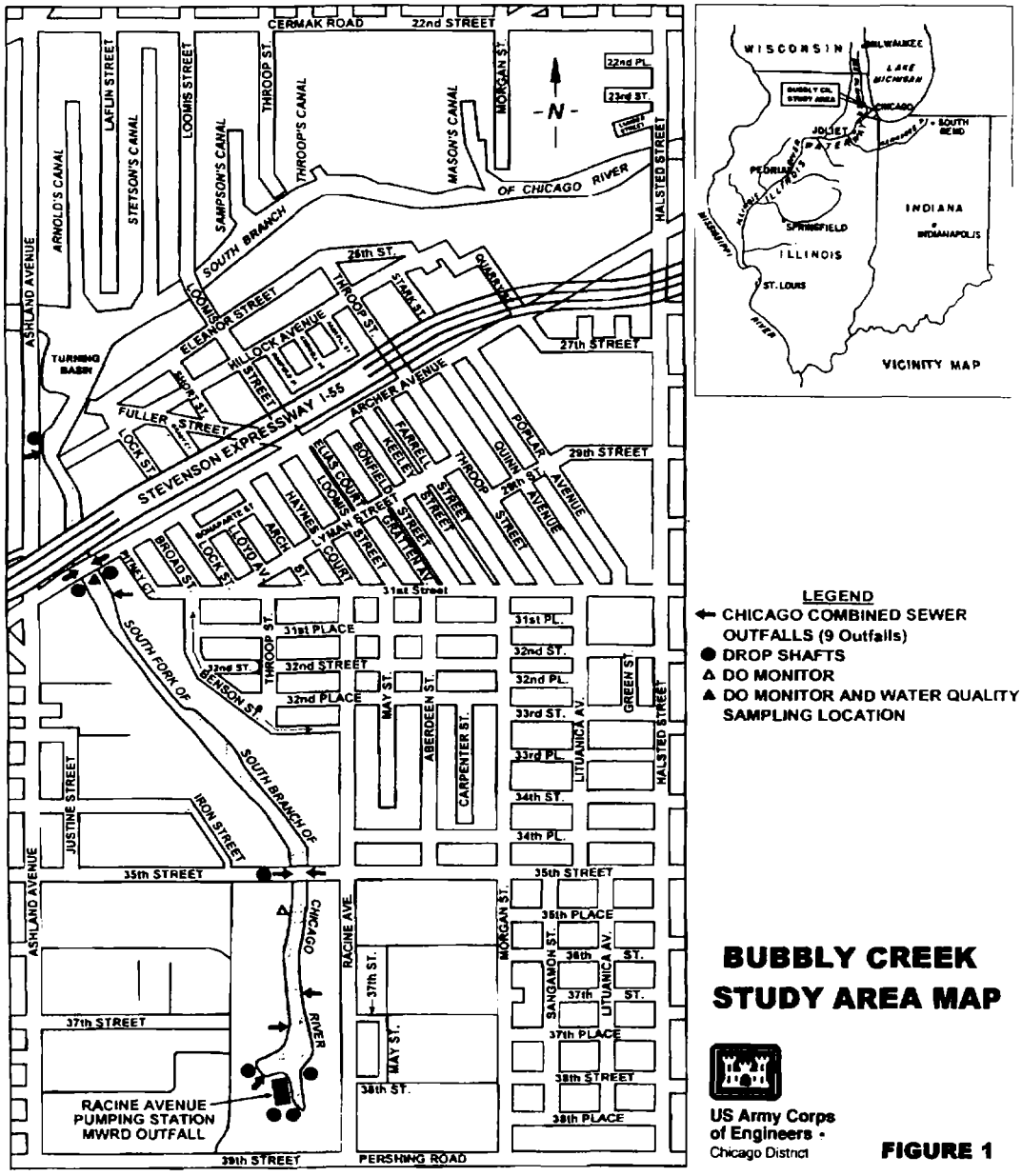

Figure 1: Bubbly Creek Study Area Map

C. STATEMENT OF PROBLEMS AND OPPORTUNITIES

Bubbly Creek faces a complex series of problems that contribute to severe ecosystem degradation and which must be solved in order to allow for successful ecosystem restoration. Stagnant flow conditions, combined sewer overflows, poor sediment quality and poor water quality all contribute to the degradation of habitat and biological integrity and must be addressed in order to provide sustainable conditions for

ecosystem restoration. Successful ecosystem restoration is dependent upon restoring the conditions needed for sustainability.

Opportunities include:

- Improve stagnant flow conditions by restoring more natural low flow conditions.
- Reduce extremely high flow velocities during combined sewer overflow events.
- Reduce impacts from combined sewer overflows on water and sediment quality.
- Reduce contaminant migration from existing sediments.
- Improve water quality for aquatic habitat, fish and wildlife, and channel aesthetics.
- Increase or improve riverine and riparian habitats.
- Restore native plant communities within the river corridor.
- Restore wetlands within the river corridor.
- Restore natural stream processes allowing for increased biological integrity.
- Provide ancillary recreational benefits.

D. WITHOUT PROJECT CONDITIONS

The future without-project condition of Bubbly Creek is expected to remain in a highly degraded state. Stagnant conditions, combined sewer overflows, and contaminated sediments will continue to contribute to poor water quality, severe habitat degradation, and continued loss of habitats that support various life stages of aquatic and terrestrial biota. Water quality is projected to slightly improve once the TARP system is fully operational due to less frequent CSO events. Since overflows will not be completely eliminated by TARP, water quality degradation from CSO discharges will continue. Without major restoration, Bubbly Creek will remain classified as a limited contact water body also contributing to major limitations on recreational opportunities.

E. ALTERNATIVES TO BE CONSIDERED IN THE FEASIBILITY STUDY

As identified in the Reconnaissance Report, the Feasibility Study will identify opportunities to implement ecosystem restoration measures within Bubbly Creek watershed. Preliminary plans were formulated by combining screened measures that meet the objectives of the study. During the feasibility study these plans along with others developed during the plan formulation process will be evaluated and the most cost effective and best-buy plans will be developed in further detail. Three preliminary restoration plans along with the required "no action" plan were identified in the Reconnaissance Report as described below.

The Corps is required to consider the option of "No Action" as one of the alternatives. No Action assumes that no project would be implemented by the Federal Government (USACE) to achieve the planning objectives. No Action, which is synonymous with the "Without Project Condition", forms the basis from which all other alternative plans are measured.

A limited plan would consider measures to restore low flows to Bubbly Creek during normal and dry weather periods. The restoration of low flows could be accomplished by pumping water from the South Branch and introducing that flow to the upstream end of Bubbly Creek near the Racine Avenue Pump Station (RAPS). The introduction of low flows would improve water quality, a limiting factor in the restoration of the Bubbly Creek ecosystem, as shown by the demonstration projects performed by Water Reclamation District of Greater Chicago (MWRDGC). Without addressing the other limiting factors, few opportunities for aquatic habitat restoration would exist due to contamination by combined sewer overflow (CSO) and bottom sediments. Major aesthetic improvements can be achieved by reducing the amount of floatable debris that collects within the channel and by reducing foul odors that stagnant waters now produce.

A more comprehensive plan would consider measures to restore low flows to Bubbly Creek during normal periods and reduce contamination from bottom sediments along with the restoration of aquatic and associated habitats. Low flow restoration would be accomplished in the same manner as the plan above. Sediment remediation measures for consideration include removal and capping. Since anaerobic decomposition of the bottom sediments produce large amounts of gas and high velocities occur in the channel during overflows, challenges exist with sediment capping at this site. Field demonstrations are recommended to assist or provide valuable information in the selection of capping materials, placement methods, and gas collection and treatment systems. Alterations to channel cross sections could be configured to allow for areas of low velocities that could sustain aquatic vegetation necessary for ecosystem restoration. Major alterations to the channel could include reconfiguring the channel to mimic natural streams where deeper portions of the channel provide the main flow conveyance, while shallow edges and floodplain areas provide calmer waters for fish spawning, rearing, and feeding. Stream bank alterations including riparian habitat restoration with river access points, trails, and other recreational features could be part of the channel alterations.

A complete comprehensive plan would consider measures to restore low flows to Bubbly Creek during normal periods, eliminate combined sewer overflow discharges and reduce contamination from bottom sediments along with the restoration of aquatic and terrestrial habitats. This ambitious plan would allow for complete restoration of Bubbly Creek to mimic a natural meandering stream with associate wetland margins. Low flow restoration would be accomplished in the same manner as the two plans above, but to less of a scale since this plan involves significantly reducing the size of the stream channel. The amount of flow needed to maintain water quality would be less when channel size is reduced. Elimination of CSO discharge could be accomplished by diverting overflows directly to the South Branch via large conveyance pipes. An inlet manifold would be necessary at RAPS in order to direct flow into the diversion pipes. Other connections between existing CSOs located along the channel, if not eliminated by the project, and the diversion pipe may be required. At the downstream end, where discharges are reintroduced to the South Branch, an energy dissipating plunge pool would be necessary

to control erosion. The diversion pipes could be placed in the existing channel in order to reduce excavation and land acquisition costs. Once CSOs are diverted from Bubbly Creek, complete ecosystem restoration would be possible. Since maintaining channel overflow conveyance capacity would be unnecessary, the cross-sectional area of the channel can be drastically reduced and reconfigured. The existing channel could be replaced with several wetland areas connected by a small meandered stream containing a series of riffle and pool complexes. The riparian area would also be drastically increased by reducing the width of the channel. Sediment remediation would be accomplished by capping and filling. Since bottom sediments can be capped with a thicker layer of substrate materials due to the removal of channel conveyance and high channel velocities limitations, sediment remediation under this plan is considered less complicated. The Reconnaissance Report identified this plan to be potentially cost prohibitive and not supportable by the non-Federal sponsor, therefore this plan will not be further evaluated during the feasibility study.

III. SCOPE OF FEASIBILITY STUDY

The Feasibility Study is the second phase of the USACE project planning process, and follows a favorable Reconnaissance Report and execution of a Feasibility Cost Sharing Agreement between USACE and the non-Federal sponsor(s). The purpose of the Feasibility Study is to fully investigate and recommend solutions to ecosystem and water resource problems identified during the reconnaissance phase.

A. STUDY SCOPE

The Feasibility Study will produce a Feasibility Report, accompanied by an environmental document that complies with National Environmental Policy Act (NEPA). This report will provide the basis for a decision by the U.S. Congress to authorize construction of a Federal project. The Feasibility Study will build upon the information contained in the Reconnaissance Report and will include the following:

Problem Identification:

- Identify existing ecosystem and water resources problems and opportunities within the Bubbly Creek study area. An emphasis will be made to expand upon problems and opportunities identified during the reconnaissance study.
- Develop objectives and constraints that address the identified problems and opportunities.
- Assess the interactions between, cumulative impacts of, and relative magnitude of each identified problem to the overall ecosystem degradation of the Bubbly Creek study area. Establish a list ranking each problem according to their contribution to existing ecosystem degradation.
- Coordinate with USEPA and IEPA to determine what portion, if any, of water quality impairments are local responsibilities in accordance with the Clean

Water Act (CWA) and Total Maximum Daily Load (TMDL) standards. Measures required to attain water quality standards should be separated.
- Coordinate with USEPA and IEPA regarding sediment quality and whether remediation falls under other federal jurisdiction that would impact this study.
- Coordinate public involvement program to ensure that public concerns are addressed and the public is apprised of study findings and proposed actions.

Plan Formulation:

- Sufficiently characterize both baseline and projected future without project conditions within the study area, which is used as a basis to compare proposed restoration alternatives and their ecosystem outputs for project justification.
- Investigate and identify possible restoration measures to address the identified problems and opportunities within the Bubbly Creek study area. Measures should include those identified, screened, and retained during the reconnaissance study along with any other new measures that can be formulated to address the identified problems and opportunities while meeting study objectives and avoiding constraints.
- Assess opportunities to restore in-channel habitats, restore wetland habitats, restore riparian habitats, reduce stagnant flow conditions, enhance water quality, and identify compatible recreation.
- Develop restoration alternatives based on evaluation results from each restoration measure. Plan formulation is an iterative process that involves formulating, evaluating, and re-formulating until an array of unique alternatives that meet the identified objectives within constraints are determined. Perform a detailed analysis on the final array of alternatives to identify the National Ecosystem Restoration (NER) plan.

Assessment and Evaluation:

- An evaluation tool and procedure used to quantify the ecosystem outputs of proposed restoration measures will be developed. The evaluation procedure selected will be based upon established assessment tools that have been successfully utilized in similar environments. The selected procedure will be reviewed and concurred upon by USACE Headquarters prior to the development of the final array of restoration alternatives.
- The implementation costs and ecosystem benefits of each identified restoration measure will be evaluated and assessed.
- Innovative measures that have not been utilized in similar environmental conditions, such as the use of active capping of sediments, may require laboratory and/or field scale tests to determine the applicability and magnitude of ecosystem benefits.
- Assess and evaluate the cumulative benefits of each restoration alternative.

- Perform a cost effectiveness and incremental cost analysis (CE/ICA) of each restoration alternative and evaluate "best-buy" plans using IWR-PLAN Decision Support Software.
- Perform a Phase II Environmental Site Assessment (ESA) and a hazardous, toxic and radioactive waste (HTRW) investigation for project area.
- Assess the environmental effects of the alternatives and prepare an appropriate NEPA document: an Environmental Impact Statement (EIS) or an Environmental Assessment (EA). Develop a mitigation plan for any environmental impacts identified. Since this study has been authorized under an ecosystem restoration authority, it is anticipated that recommendations will not incur environmental impacts requiring mitigation.
- Coordinate with the U. S. Fish and Wildlife Service including receipt and review of a Fish and Wildlife Coordination Act report.
- Analyze measures in accordance with compliance of floodplain and water quality permitting requirements.
- Comply with applicable statutes, executive orders, memoranda, and policies.

Report Preparation:

- Prepare a Feasibility Report with sufficient detail to support a decision for construction authorization.
- Prepare report appendices, design plates, and quantity estimates that provide backup documentation and support report recommendations.
- Document project costs and environmental benefits. A Microcomputer Aided Cost Engineering System (MCACES) estimate will be prepared for the recommended plan.
- Confirm or deny interest in the USACE's implementation of a candidate project. A positive recommendation must be supported by the non-Federal sponsor(s).
- Develop a preliminary project design as a basis for preparing a Design Documentation Report (if necessary) and plans and specifications.

Technical and Policy Compliance Reviews:

- Feasibility reports must undergo both technical and policy compliance review.
- Technical review will be performed by a combination of independent experts within USACE, other federal agencies, private consultants, and/or the non-Federal sponsor(s).
- Policy compliance review is done at the USACE Division and Headquarters levels and is intended to identify and resolve policy concerns that might otherwise delay or preclude approval of feasibility reports. Prior to preparation of the draft feasibility report, a minimum of two compliance reviews including a Feasibility Scoping Meeting (FSM) and Alternative Formulation Briefing (AFB) must be completed. If there are additional requirements for Headquarters involvement in the study that are not met by

the FSM and/or the AFB, an Issue Resolution Conference (IRC) or In-Progress Review (IPR) may be held.

Preconstruction Engineering and Design Agreement:

- Analyze project implementation requirements, including construction cost-sharing requirements and an ability-to-pay analysis of the non-Federal Sponsor(s) financial plan.
- Prepare a PMP that describes the tasks and associated costs required during all phases of the Preconstruction Engineering and Design (PED) phase and Construction phase.
- Draft a Preconstruction Engineering and Design (PED) Agreement.
- Produce a draft Project Cooperation Agreement (PCA) with the non-Federal sponsor(s) to share project implementation costs.

The designs, analyses, and evaluations will comply with existing laws; Water Resource Council Economic and Environmental Principles for Water and Related Land Resource Implementation Studies (Principles and Guidelines); and all USACE policies, procedures, guidance, and regulations. The designs, analyses, and evaluations will also be consistent with sound engineering principles and standards; will meet safety and function requirements; and will reflect good stewardship of natural and man-made resources. Engineering studies and analyses are scaled to the minimum level needed to establish adequate project features that will form a basis for the project schedule and cost estimate. Uncertainties are to be reflected in contingencies that will be resolved during the subsequent Preconstruction Engineering and Design (PED) Phase. Appropriate references will be made to applicable laws, regulations, and manuals.

B. MANAGEMENT AND COORDINATION

This effort is a partnership between the Chicago District and the City of Chicago. Management and coordination of each aspect of the feasibility study will be accomplished through a hierarchy of three levels each having specific duties as show in *Figure 2* below.

Overall study management shall be the responsibility of an Executive Steering Committee (ESC), which at a minimum will consist of members from the Chicago District and DOE. Other agencies maybe added to the ESC if deemed appropriate after initiating the study. The ESC will either meet collectively or by other means of communication.

The ESC will manage the overall study by: (1) maintaining a working knowledge of the feasibility study; (2) assisting in resolving emerging policy issues; (3) ensuring that evolving study results and policies are consistent and coordinated; (4) directing the study management team; (5) rating decisions made by the study management team; and (6) maintaining authority over approving budget variations.

A Project Delivery Team (PDT) will consist of designated team members from the Chicago District, the non-Federal sponsor(s), and other agencies as deemed appropriate after initiating the study. The PDT will be led by Chicago District staff including the Project Manager, Study Manager (Planning Branch), and Lead Engineer (Technical Services Division). Representatives from the Chicago District's Office of Counsel, Resource Management, Information Management, Contracting, and Public Affairs will be consulted as necessary. The PDT will coordinate on all matters relating to progression of the study, which includes cost estimates, schedules, completion of work elements, financial transactions, and recommendations to the ESC for actions to be taken on modifications to the PMP. PDT meetings will be held at on 4 to 6 week intervals, but may be more frequent at critical decision points.

A series of product teams (PTs) responsible for producing individual products associated with each aspect of the feasibility study and will consist of a variety of expertise required to product quality services and/or products. Each PT will have a designated Product Lead that reports on team progress to the PDT. PTs can be made up of Chicago District or other USACE in-house staff, DOE in-house staff, other outside agency staff, or consultants. The makeup of each PT will vary in by product as different expertise is required for each technical product. The PT for each individual feasibility study product can be found in the *Detailed Investigations Section II.D* below.

During feasibility phase, the overall team leader will be the Project Manager. The project manager will coordinate with the members of the various PTs and will be the main point of contact with the ESC and other interests. The project manager will provide monthly progress reports to the ESC.

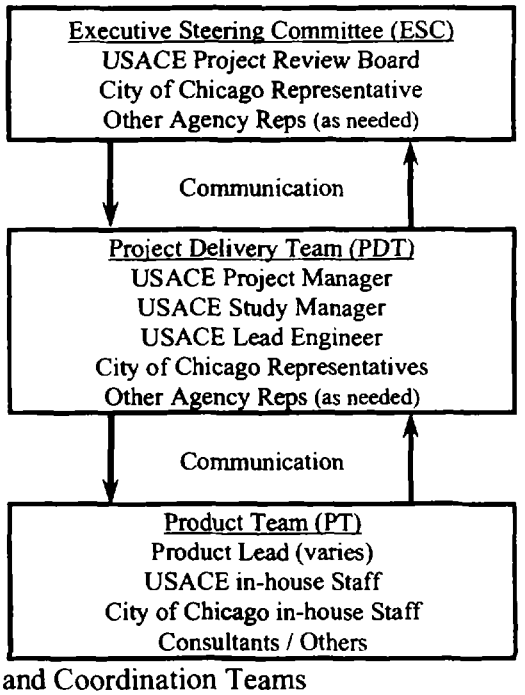

Figure 2: Management and Coordination Teams

C. FEASIBILITY STUDY PRODUCTS

This section of the PMP provides a definition of the products and a description of the tasks to be accomplished during the course of the Feasibility Study. For accounting and administrative purposes, all tasks, including in-kind services provided by the non-Federal cost-sharing partner, are categorized by cost sub-accounts according to USACE standards for cost estimating general investigation studies (e.g. 22A, 22B, etc). The entire feasibility study is projected to cost **$2,650,000** and is broken down into specific sub-accounts and cost shared equally between the District and the non-Federal sponsor.

These sub-accounts are further divided into tasks that are specifically applicable to the proposed feasibility study and reflect the needs and grant obligations of the non-Federal partner. *Table 1* below is a summary of the cost break down for each sub-account. Acceptance of in-kind services will be subject to appropriate review by USACE and the Assistant Secretary of the Army for Civil Works (ASA-CW).

Sub-Account	Description	Total Cost	USACE		non-Federal Sponsor(s)	
			In-house	Contract	In-house	Contract
22A	Public Involvement	$59,150	$11,600	$0	$17,550	$30,000
22B	Institutional Studies	$24,700	$20,800	$0	$3,900	$0
22C	Social Studies	$32,800	$2,900	$0	$3,900	$26,000
22D	Cultural Resources Studies	$63,300	$3,400	$0	$3,900	$56,000
22E	Environmental Studies	$262,350	$177,000	$47,000	$5,850	$32,500
22F	Fish and Wildlife Studies	$24,000	$9,000	$15,000	$0	$0
22G	Economic Studies	$35,200	$35,200	$0	$0	$0
22H	Real Estate Analysis	$102,350	$43,800	$0	$11,050	$47,500
22J	Hydrology/Hydraulics Studies	$432,600	$112,200	$310,000	$10,400	$0
22K	Geotechnical Studies	$368,650	$104,600	$232,000	$4,550	$27,500
22L	HTRW Assessments	$254,500	$50,400	$75,000	$9,100	$120,000
22N	Surveys and Mapping	$135,700	$11,200	$0	$6,500	$118,000
22P	Design/Project Cost Estimates	$81,000	$81,000	$0	$0	$0
22Q	Planning Technical Management	$86,750	$77,000	$0	$9,750	$0
22R	Plan Formulation and Evaluation	$293,950	$258,200	$0	$35,750	$0
22S	Feasibility Report Preparation	$166,550	$116,800	$40,000	$9,750	$0
22T	Programs and Project Management	$71,400	$58,400	$0	$13,000	$0
22 V	Initial Draft PCA and PED Agreement	$48,050	$34,400	$0	$13,650	$0
22Y	Washington Level Review	$50,000	$25,000	$0	$25,000	$0
22Z	Peer Review Plan	$57,000	$57,000	$0	$0	$0
Baseline		$2,650,000	$1,289,900	$719,000	$183,600	$457,500

Table 1: Cost Breakdown Summary by Sub-Account

The majority of this section of the PMP is devoted to specific descriptions of each feasibility study task, which includes the technical studies and investigations to be accomplished; the reasons for each task; the techniques, models, and procedures to be used; the organizational elements responsible for each task; and the timing, schedule and cost of each task.

This PMP covers the development of four products prior to the initiation of Preconstruction Engineering and Design (PED):

Feasibility Report and NEPA Compliance

This product includes all activities leading to the approval of the final Feasibility Report by the Chief of Engineers. It addresses in detail identified problems and opportunities, associated study goals and objectives, plan formulation activities, and a recommended plan for implementation. It will also include NEPA and other environmental compliance documents required. This product and its results will be coordinated with all interested parties including other related Federal and non-Federal agencies (USEPA, USFWS, MWRDGC, IEPA). It will include independent technical review (ITR), external peer review (EPR) (if required), and policy reviews by Great Lakes and Ohio River Division (CELRD), USACE Headquarters (HQUSACE), Assistant Secretary of the Army for Civil Works (ASA-CW) for transmittal to the Congress. The Feasibility Study, culminating in the Notice of the Division Engineer, is scheduled for completion in January 2011.

The NEPA document (an EA or EIS) will include all activities leading to the assessment of environmental impacts and benefits of the various alternatives and recommended plan in compliance with NEPA requirements. These activities include scoping and preparation of the environmental document, public coordination and review, and notification of findings. The alternative analysis will investigate the positive and negative aspects of each alternative proposed in the Feasibility Study. Since this study has been authorized under an ecosystem restoration authority, it is anticipated that recommendations will not incur environmental impacts requiring mitigation.

Preliminary PCA and Financing Plan

As the details of the recommended plans are finalized, coordination will be undertaken with the non-Federal sponsor(s) to review the model language of the Project Cooperation Agreement (PCA) for construction of the project. Letters of Intent that acknowledge the requirements of local cooperation and express good faith intent to provide those items for the recommended project will be developed. Additionally, the non-Federal Sponsor(s) will develop preliminary plans for financing their share of the project costs. The Chicago District will then complete the assessment of these plans and an ability to pay analysis. The coordination of the PCA model and the preliminary financing plans will be completed in conjunction with the draft Feasibility Report.

Project Management Plan

The development of a draft PMP for the Preconstruction Engineering and Design (PED) Phase will be prepared. This PMP will address how the PED phase will be developed based on the recommendations laid out in the Feasibility Report for authorization. The draft PMP will address design tasks, costs, and schedule of PED activities. These activities include a Design Documentation Report (DDR) (if necessary) and preparation of plans and specifications for construction contracts. These documents will form the basis for the project management plan to be finalized for project construction. The draft PMP for the PED phase will be completed in conjunction with the draft Feasibility Report.

Other Supporting Plans

Other supporting plans will be developed as needed as the study progresses to address specific items such as local cooperation, real estate acquisition, quality control, value engineering, environmental and cultural matters, safety and security, and operation and maintenance. A draft peer review plan (PRP) has been developed and attached in *Attachment E – Peer Review Plan.*

D. DETAILED INVESTIGATIONS

The various tasks to be accomplished are listed in the following paragraphs. In addition, the specific tasks designated to each resource along with the corresponding estimated time and cost is attached in *Attachment A - Summary of Costs by Sub-Account.*

Public Involvement and Coordination - (Sub-Account: 22A)

Public involvement is necessary to ensure that the feasibility study is responsive to the needs and concerns of the public. The objectives of public involvement are to provide information about the study to the public, make the public's desires, needs, and concerns known to decision-makers; to provide for consultation with the public before decisions are reached; and to take into account the public's views in reaching decisions.

The Study Manager will implement public involvement, which will include programs necessary to represent the public's views and to identify problem areas for further studies. This will be accomplished through public notices, public workshops, and other miscellaneous meetings with interested stakeholders and local officials. The District and non-Federal sponsor(s) will participate in all of these meetings. Coordination with state and local agencies will be initiated immediately and will be maintained throughout the study process. Coordination will also be maintained with the U.S. Fish and Wildlife Service (USFWS), the U.S. Environmental Protection Agency (USEPA), Illinois Environmental Protection Agency (IEPA), Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), and Friends of the Chicago River (FCR).

A public notice will be prepared at the initiation of the Feasibility Study; this notice will be mailed to all agencies, organizations, media, and individuals that are known to be interested or might be interested in the study. The public notice will state that the Feasibility Study is beginning, present the scope of the Feasibility Study and the findings of the Reconnaissance study, and solicit comments from interested parties.

During the early stage of the Feasibility Study, a public meeting/workshop will be required to confirm the problems identified during the reconnaissance study exist and to provide the opportunity to identify new ones. The Planning Branch will provide the notice of the workshop, including printing and mailing, identify location for the workshop, schedule facilities, prepare the presentation, prepare the illustrations and slides, record the information gathered, document the information, and dissemination the information to the public. This will constitute the start of the NEPA scoping process.

After plan formulation, a second public meeting will be held during the 30-day public review period of the Feasibility Report to present the study results, to announce tentative recommendations, and to solicit public comments.

A Bubbly Creek Project website will be developed and updated on a frequent basis. The City of Chicago will be responsible for developing the scope of work, negotiating, and administrating the contract for the project website.

Newsletters, fact sheets and /or individually written letters may be generated to keep interested parties updated on the status of the project. Meetings will be held with local officials and residents to obtain data for the study analyses and coordinate specific plan formulations. Working closely with the District Public Affairs Officer (PAO), the City of Chicago and their contractor will lead the public involvement program.

This task requirement is:

Federal Costs	TOTAL:	$11,600
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	1 workdays	$1,200
Planning Branch	2 workdays	$2,000
Economic & Plan Formulation Section	4 workdays	$3,200
Environmental & Social Analysis Section	4 workdays	$3,200
Programs & Project Management Branch	2 workdays	$2,000
Non-Federal Costs	TOTAL:	$47,550
City of Chicago Labor:		
Department of Planning	18 workdays	$11,700
Department of Environment	5 workdays	$3,250
Mayor's Office	4 workdays	$2,600
Miscellaneous Costs:		
Contractural Project Website		$30,000
TASK SUB-ACCOUNT 22A	**TOTAL:**	**$59,150**

Institutional Studies/Report - (Sub-Account: 22B)

An investigation will be conducted and a report prepared to identify the jurisdictions, concerns and authorities of the non-Federal sponsor(s), and to determine the level of interest of agencies and organizations that may be involved in the study. The legal and institutional requirements for implementation of project features (including those to be implemented by the non-Federal sponsor(s) and other local agencies) will also be identified.

A financial analysis will be performed to determine the financial capability of the non-Federal sponsor(s). The analysis will include an assessment of the sponsor's financial capability, a statement of financial capability/ability to pay, and a financing plan. The District will evaluate the non-Federal sponsor(s) financial capability for project construction and handling post-construction project costs such as operation and maintenance, vegetative and structural repairs or replantings, and long-term replacements of project features.

The Planning Branch will prepare a financing plan for the project implementation, including Government outlays, Sponsor cash and credit contributions, use of lands and disposal areas requirements by Fiscal Year. To the extent that the non-Federal sponsor(s) contributes funds to the project and the respective capabilities will be explored. It is assumed that multiple local government agencies (MWRDGC, City of Chicago Park District, etc.) will be operating and maintaining the project features.

The statement of financial capability will include a clear description of the non-Federal sponsor(s) capability to meet their financial obligations for the project in accordance with the project-funding schedule. The statement of financial capability will include evidence of the non-Federal sponsor(s) authority to utilize the identified sources of funds and will provide information on the non-Federal sponsor(s) capability to obtain remaining funds, if any.

An ability to pay analysis will be prepared in compliance with the requirements of ER 1105-2-100 and the provisions of the Water Resources Development Act (WRDA) of 1986. The analysis will determine the non-Federal sponsor(s) eligibility to reduce its cost-sharing responsibilities based on local economic conditions. The statement will be certified by the District Engineer, which may require an analysis/verification of abilities by the Chicago District Planning Branch.

This task requirement is:

Federal Costs	TOTAL:	$20,800
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	1.5 workdays	$1,800
Planning Branch	3 workdays	$3,000
Economic & Plan Formulation Section	20 workdays	$16,000
Non-Federal Costs	TOTAL:	$3,900
Chicago of Chicago Labor:		
Department of Environment	1 workdays	$650
Department of Legal	5 workdays	$3,250
TASK SUB-ACCOUNT 22B	**TOTAL:**	**$24,700**

Social Resources Studies - (Sub-Account 22C)

An inventory of the human resources within the study area will be created using 2000 census data and used to establish a human resource profile of the study area. Sociological, economic, and demographic conditions for the project area will be documented in the Feasibility Report. Impacts of the alternatives to human resources will be assessed and described in the appropriate NEPA document (EA or EIS). Demographic data parameters presented in the report will include, but not be limited to population, employment and unemployment data, household information, and land use development. All impacts will be studied for both the with and without project conditions. The City of Chicago will be responsible for developing the scope of work, negotiating, and administrating the social resources studies contract.

This task requirement is:

Federal Costs	TOTAL:	$2,900
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	0 workdays	$0
Planning Branch	0.5 workdays	$500
Environmental & Social Analysis Section	3 workdays	$2,400
Non-Federal Costs	TOTAL:	$29,900
City of Chicago Labor:		
Department of Planning	5 workdays	$3,250
Department of Environment	1 workdays	$650
Miscellaneous Costs:		
Contractual Services		$26,000
TASK SUB-ACCOUNT 22C	**TOTAL:**	**$32,800**

Cultural Resources Studies - (Sub-Account 22D)

The cultural resources investigations will consist of collecting information from regional histories, historic maps, and existing GIS databases to identify known sites in the Chicago River Basin. Where needed, limited field surveys will be conducted to include surface collection, plowing, and shovel-testing by a qualified archaeologist. Historic resource considerations that influence the plan recommendations will be clearly identified in the Feasibility Report; supporting documentation and coordination required under NEPA will be prepared and attached to the NEPA document. Coordination and comprehensive documentation of results will be provided to the State Historic Preservation Office (SHPO) for Section 106 consultation and review. The SHPO will be consulted to ensure compliance with the National Historic Preservation Act (NHPA) and other applicable state requirements. The City of Chicago will be responsible for developing the scope of work, negotiating, and administrating the cultural resources studies contract.

All related right-of-entry permits associated with Phase I site investigations will be prepared by the District's Real Estate Division. This cost estimate does not include any Phase II archaeological or historical investigations; the Phase I survey will be conducted in sufficient detail to determine the potential Register eligibility of identified sites.

This task requirement is:

Federal Costs	TOTAL:	$3,400
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	0 workdays	$0
Planning Branch	1 workdays	$1,000
Environmental & Social Analysis Section	3 workdays	$2,400
Non-Federal Costs	TOTAL:	$59,900
City of Chicago Labor:		
Department of Planning	5 workdays	$3,250
Department of Environment	1 workdays	$650
Miscellaneous Costs:		
Contractual Services		$56,000
TASK SUB-ACCOUNT 22D	**TOTAL:**	**$63,300**

Environmental Resources Studies - (Sub-Account 22E)

Environmental studies will be performed to assist in the identification, design, evaluation and selection of proposed ecosystem restoration alternatives. Environmental reports will present a full evaluation and documentation of the significance of the environmental impacts, in accordance with National Environmental Policy Act (NEPA), ER 1105-2-100, ER 220-2-2, and other applicable laws, statutes, Executive Orders, and regulations. A NEPA document will be prepared to accompany the Feasibility Report. NEPA documentation will be coordinated with State and Federal environmental agencies and the public. Scoping of the NEPA document will be completed via written correspondence with the appropriate agencies and concerned parties. A mailing list will be compiled and updated as necessary throughout the study. The NEPA document will be released for public review and comment. The NEPA document will be incorporated into the Final Feasibility Report. The NEPA document will also include the Section 404 evaluation and Finding of No Significant Impacts (FONSI) or Record of Decision (ROD).

Because this study will focus on environmentally amenable restoration alternatives in the South Fork of the South Branch of the Chicago River, it is not anticipated that fish and wildlife mitigation will be required. However, the analyses required under NEPA will be carried out and documented in the NEPA document. In the event that significant impacts are identified during the assessment period, a negotiation meeting will be held by the Executive Steering Committee (ESC) to decide if conversion to an EIS is necessary. Likewise, if significant comments are received from the public review that requires additional time and/or costs, the ESC will agree upon the required changes.

An inventory will be prepared describing the natural resources that are located within the study area. The inventory report will specify the goals and objectives for ecosystem restoration opportunities within the project area. Previous studies have been undertaken and will be incorporated into the report. All relevant data and prior biological investigations will be collected and reviewed in order to assess current understanding of the biological traits of the study area. This review will also identify data gaps that will need to be addressed. Field biological sampling will be required and accomplished with Chicago District staff and equipment. The regional and national significance of natural resources within the study area will be described and evaluated, based on special river/stream or land within the basin by Federal or State agencies, and may include threatened and endangered species; rare, unusual, or scenic habitat types; land forms; or waterways.

Field collection of sediment flux rates, gas generation, and water quality data will be required. In-situ measurements of water quality parameters (dissolved oxygen, nutrients (N&P), algae (chlorophyll and algae groups), organic load (BOD, CBOD), boundary loads (storm runoff/overflow CSOs) will be collected and used in formulating and evaluating restoration measures. Modeling, laboratory and/or field tests of fluxes can be performed to generate the flux estimates and to estimate the effects of various processes such as diffusion, groundwater, and gas generation.

A structural and functional habitat assessment will entail identifying one or more indicators for each ecosystem function that can be readily measured in the field and combined to provide an index of ecosystem habitat output. The habitat assessment techniques adopted for the specific habitat or indicator species will be employed to establish existing condition ecological functions in the project area, assist in the formulation of habitat restoration alternatives, and quantify increases in ecological outputs associated with plans and plan scales. Project ecologists will participate as study team members in the formulation of habitat restoration measures and alternatives by assisting in the following tasks: (1) selection of restoration goals, (2) determination of appropriate structures and functions to be restored; and (3) identification of restoration techniques used to reduce impairments. Project ecologists also will identify the relationships (i.e. dependencies, non-additivity, mutual exclusivity) between restoration measures. After the initial screening process, project ecologists will quantify the expected ecological outputs and gains associated with each alternative (and scale of alternative) for use in conducting the cost effective and incremental cost analysis (CE/ICA) that is required to select the recommended plan.

This task requirement is:

Federal Costs	TOTAL:	$224,000
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	5 workdays	$6,000
Planning Branch	23 workdays	$23,000
Environmental & Social Analysis Section	95 workdays	$76,000
Programs & Project Management Branch	18 workdays	$18,000
Technical Services Div.	2 workdays	$2,400
Design Branch	3 workdays	$3,600
Chief, Hydraulic & Env. Engineering	8 workdays	$8,000
Hydraulic & Env. Engineering Section (HE)	50 workdays	$40,000
Miscellaneous Costs:		
Equipment Use for Biological Field Sampling		$2,000
Contractual Water Quality Survey		$20,000
Contractual Sediment Flux Survey		$25,000
Non-Federal Costs	TOTAL:	$38,350
City of Chicago Labor:		
Department of Environment	9 workdays	$5,850
Miscellaneous Costs:		
Contractual Services		$32,500
TASK SUB-ACCOUNT 22E	**TOTAL:**	**$262,350**

Fish and Wildlife Coordination Act Report – (Sub-Account 22F)

As required by the Fish and Wildlife Coordination Act (FWCA), as amended, Public Law 85-624; 16 U.S.C. 661, et seq., the Chicago District will coordinate with the U.S. Fish and Wildlife Service (USFWS) to ensure that fish and wildlife resource conservation is given equal consideration with other purposes in project selection. Study team ecologists will coordinate with the USFWS in providing and reviewing information necessary to assist the USFWS in rendering a draft and final opinion under the Coordination Act. The Chicago District will coordination with the USFWS, respond to the Coordination Act Report, and develop a mitigation plan as required.

An inter-agency transfer of funds will be provided to the USFWS to compensate them for their involvement in the study and preparation of the Coordination Act Report. The USFWS will participate in the study scoping, identification of fish and wildlife concerns, identification of available information, determination of the significance of fish and wildlife resources, and quantification of anticipated impacts. The Coordination Act Report and all coordination documentation will accompany the Feasibility Report and NEPA document.

This task requirement is:

Federal Costs	TOTAL:	$24,000
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	0 workdays	$0
Planning Branch	1 workdays	$1,000
Environmental & Social Analysis Section	10 workdays	$8,000
Miscellaneous Costs:		
USFWS Coordination Act Reimbursement		$15,000
Non-Federal Costs	TOTAL:	$0
City of Chicago Labor:		
Department of Planning	0 workdays	$0
Department of Environment	0 workdays	$0
TASK SUB-ACCOUNT 22F	**TOTAL:**	**$24,000**

Economic Analysis- (Sub Account 22G)

Socioeconomic studies will be performed in compliance with the requirements of ER 1105-2-100. The purposes of socioeconomic studies are to assist in problem identification, to characterize the social and demographic characteristics of affected populations, and to describe the social and economic benefits and costs of alternative solutions.

Ecosystem restoration benefits will be evaluated in terms of cost effectiveness and incremental cost analysis (CE/ICA) techniques. Other benefits, such as those associated with recreation and improved access will be quantified in the economic analysis report. Incorporating risk and uncertainty into the economic analysis is required by the Planning and Implementation guidance. Risk and uncertainty will be considered in this analysis and the most appropriate methods available will be used as applicable. A CE/ICA will be performed for alternatives that provide for ecosystem benefits in the channel including: improving stagnant flow conditions by restoring more natural low flow conditions; reducing extremely high flow velocities during combined sewer overflow events; reducing impacts from combined sewer overflows on water and sediment quality; reducing contaminant migration from existing sediments; improving water quality for aquatic habitat, fish and wildlife, and channel aesthetics; increasing or improving riverine and riparian habitats; restoring native plant communities within the river corridor; restoring wetlands within the river corridor; and restoring natural stream processes allowing for increased biological integrity. The analysis will be accomplished with the US Army Corps of Engineer's IWR-PLAN Decision Support Software, or a like program, which evaluates the cost effectiveness of the alternatives under consideration

for ecosystem restoration and ranks them based on incremental cost effectiveness according to cost and habitat output.

An Economics Appendix will be prepared to include the results of the CE/ICA associated with the ecosystem restoration components of the study.

This task requirement is:

Federal Costs	TOTAL:	$35,200
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	1 workdays	$1,200
Planning Branch	2 workdays	$2,000
Economic & Plan Formulation Section	15 workdays	$12,000
Environmental & Social Analysis Section	25 workdays	$20,000
Non-Federal Costs	TOTAL:	$0
City of Chicago Labor:		
Department of Planning	0 workdays	$0
Department of Environment	0 workdays	$0
TASK SUB-ACCOUNT 22G	**TOTAL:**	**$35,200**

Real Estate Analysis/Documents- (Sub Accounts 22H)

For cost-shared projects, real estate acquisition and performance of facility and utility relocations are responsibilities of the non-Federal sponsor(s). Therefore, a real estate specialist will participate with Planning, Project Management and other District elements in the discussion of project requirements with the non-Federal sponsor(s). Further, the real estate specialist will initiate discussions with the non-Federal sponsor(s) regarding acquisition procedures and policies, including compliance with P. L. 91-646, as amended, lands, easements, rights-of-way, relocations and disposal areas (LERRDs) crediting procedures, and milestones for land acquisition. The real estate specialist will regularly consult with the non-Federal sponsor(s) throughout the feasibility phase as to the LERRD and facility/utility relocation requirements of the project as it proceeds to final formulation. No LERRDs shall be acquired prior to signing the Project Cooperation Agreement (PCA). The City of Chicago plans to perform several of the required work activities through contracts and will be responsible for developing the scope of work, negotiating, and administrating contract(s) for determining LERRDs, preliminary opinion of compensability, and developing the real estate plan.

Innovative real estate approaches will be developed wherever possible on this project, however, it should be noted that there are numerous regulations governing land acquisition and crediting. The real estate specialist will advise the non-Federal sponsor(s) on the crediting procedures. If deviations from existing regulations are

requested, review and approval from Headquarters USACE will be required. Real estate situations are governed by public law, such as the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

The real estate specialist will develop a preliminary cost estimate for alternative project sites in order to assist the study team in selecting project features for recommendation. It is assumed that several alternatives will require the acquisition and/or use of private property. Available information will be used to predict the impact of the proposed alternative on property values in the vicinity of the proposed project feature area.

The real estate specialist along with the City of Chicago and their contractor will prepare a Real Estate Plan (REP) that identifies and describes the lands, easements and rights-of way (LERRDs) required for the construction, operation, and maintenance of a proposed project, including those required for relocations, borrow material, dredged and excavated material disposal, staging/storage areas, facility/utility relocations, and mitigation. Further, the REP will describe the estimated LERRD value, together with the estimated administrative and incidental costs attributable to providing project LERRD, and the acquisition process (e.g., who will be acquiring, types of ownerships, non-Federal sponsor(s) ability to acquire land) that will be required to support project implementation.

A gross appraisal report will be prepared as part of the REP, which contains detailed accounting of property ownership, property evaluation for possible easement rights or acquisition of impacted project lands, local economic conditions that may affect the trend of real estate values in the community; and the gross estimate of the LERRDs required for project implementation.

The real estate specialist will assist the Project Development Team (PDT) in preparation of an initial set of maps showing the potential lands, easements, rights-of-way, utilities, facilities to be relocated, and temporary work areas/staging areas required for the recommended project. These maps will be superimposed on the project site plans. All mapping will be available in digital as well as printed format.

The REP will include a physical taking analysis, which includes a realistic estimate of administrative costs, giving due recognition to existing and foreseeable conditions. Included as a minimum requirement will be estimated administrative costs for mapping review, appraising, title evidence, negotiating and closing direct purchases, condemnation, and relocation assistance, a summary of project real estate costs, a schedule of acquisition, discussion and recommendations concerning the non-standard estates proposed for acquisition, and the extent of the existing navigational servitude in accordance with ER 1165-2-302.

The Preliminary Attorney's Opinion of Compensability will be prepared by the City of Chicago and their contractor for every utility facility potentially affected by the project. It is a description of the facility or utility relocations that must be performed,

including information regarding the general nature of the impact to each facility or utility; the identity of the owners of the affected facilities and utilities; the purpose of the affected facilities and utilities; whether the owners have compensable real property interests in the land on which the impacted portion of the facility or utility is located; the conclusions reached in the Attorney's Opinion of Compensability prepared in support of the relocation determinations; whether special legal authority or direction affects relocation classification (for example, the project's authorizing legislation or reports referenced therein; Section 111 of the River and Harbor and Flood Control Act of 1958 (33 U.S.C. §633)); and other information relevant to the proper identification and performance of relocations necessitated by construction, operation, or maintenance of the project.

The real estate specialist will obtain rights-of-entry permits as necessary for various studies. Rights-of-entry permits will be obtained for purposes of environmental investigations, cultural assessments, soil and sediment sampling, surveys, exploration, etc. Documentation will be prepared that provides evidence that permission was obtained from a landowner to temporarily use his/her land for a specific time and purpose.

This task requirement is:

Federal Costs	TOTAL:	$43,800
Detroit District Labor:		
Real Estate Div.	5 workdays	$6,000
Acquisition Branch	24 workdays	$25,200
Appraisal Branch	14 workdays	$12,600
Non-Federal Costs	TOTAL:	$58,550
City of Chicago Labor:		
Department of Planning	2 workdays	$1,300
Department of Environment	7 workdays	$4,550
Department of Legal	8 workdays	$5,200
Miscellaneous Costs:		
Contractual Services		$43,500
Contractual Title Search		$4,000
TASK SUB-ACCOUNT 22H	**TOTAL:**	**$102,350**

Hydrology and Hydraulic Studies- (Sub Account 22J)

An appendix to the Feasibility Report will be prepared to detail the results of hydraulic and hydrologic (H&H) studies conducted during the Feasibility Study to characterize the study area and design and evaluate alternative plans. Activities to be

performed and documented in the H&H report include: development of input data; calibration and verification of hydrologic and hydraulic models; characterization of surface drainage patterns; model adjustments for baseline and future without project conditions; alternative screening; analysis of risk and uncertainty (as applicable); hydraulic design of alternatives; refinement of with project hydrologic engineering analysis; activity estimate of Preconstruction Engineering & Design (PED) phase; and preparation of a H&H Appendix to the Feasibility Report. This task also includes attendance at study team meetings and coordination with the non-Federal sponsor(s) staff.

The existing dynamics of the combined sewer overflows will be reviewed and any missing data that is necessary and not already been provided by MWRDGC or the City of Chicago would be collected. Data would include dynamics of the system, recorded hydrologic data of the wetwell/sump inflows, gravity overflows from interceptors to drop shafts, Racine Avenue Pumping Station (RAPS) pumping to Bubbly Creek (frequency and volume), pumping and/or gravity flows to interceptors and Tunnel and Reservoir Plan (TARP) tunnels, and direct combine sewer overflow (CSO) discharges to Bubbly Creek along the channel north of RAPS.

A review of the current modeling including accuracy checks is necessary. This includes verification of the Hydrologic Simulation Program – Fortran (HSPF) parameters. Additionally, the one-dimensional unsteady flow model, Tunnel Network (TNET) Model, which models the McCook reservoir and connecting TARP tunnels needs to be checked with respect to the connectivity of the contributing areas to the dropshafts. The accuracy of the model configuration as well as the percentage of flow routed to each dropshaft must be verified to ensure adequate model accuracy.

A hydraulic Storm Water Management Model (SWMM) will be developed for the sewershed areas tributary to RAPS and the downstream dropshafts and outfalls north of RAPS. Water quality will added to this model to include temperature, dissolved oxygen, biological oxygen demand, total suspended solids, and other parameters as necessary. This model will simulate the complexity of the combined sewer system and provide flow and water quality data for the combined sewer flows to RAPS and the dropshafts and outfalls north of RAPS along Bubbly Creek.

The operation of RAPS will be included in the newly developed SWMM model, which includes the addition of modeling the wetwell/sump inflows from their respective contributing areas and adding the pumping capability of RAPS. The pumping routine coding must include decision making routines that mimic the operation of RAPS as to when the pumps operate and to where flows are discharged. Pumping can occur to an interceptor which flows to the Stickney water reclamation plant (dry weather conditions), or to the dropshafts which flow to the TARP tunnels (typical rain event conditions), or directly to Bubbly Creek (CSO event).

The TNET model will also need to updated to include the ability to keep dropshafts at RAPS closed until the TARP tunnel pressurizes. Based on various modeling over the years the initial operating plan calls for the specific dropshaft gates at RAPS to be closed until the tunnel pressurizes to minimize the effect of surging and geysering. It is possible that the TARP dropshafts at RAPS may have to restrict flows to some extent (either by having them fully closed or partially open) until the tunnel pressurizes to avoid surging. Consequently, this capability needs to be added into the hydrologic modeling. A comparison of worst case scenario (fully closed) and best case scenario (fully open) drop shaft operations are needed as the final operation plan has not been determined. Current modeling, and that which was done for the McCook DDR, assumed that the dropshafts at RAPS will be able to eventually be operated in a fully open state at the beginning of an inflow event.

Models will be run for existing conditions without the McCook reservoir on-line in order to calibrate and verify the results. A small test period of one to three years will be run and a comparison of the simulated model results to the RAPS records will be done. Primary focus will be in the comparison of CSO discharges to Bubbly Creek from RAPS and the outfalls north of RAPS. The SWMM model will be checked against any available recorded data including combined sewer inflows to RAPS, water quality records, any measured interceptor flows to dropshafts, RAPS pumping and/or gravity flows to interceptors and TARP tunnels, RAPS CSO pumping to Bubbly Creek, and direct CSO discharges to Bubbly Creek. It is possible that some flow and/or water quality data measurements may be necessary for proper model calibration if there is a deficiency of existing recorded data. Some modifications to the TNET model will be required including the closure sequencing of dropshaft gates based on index dropshaft stages and will be modeled according to the current MWRDGC operations plan. Model stability could become an issue, requiring model iterations during the closing sequence until the model is stable.

Once an acceptable calibration is obtained, the existing condition models will need to be run for the full 52-year period of record (1949-2000). Model correlation will also be affected if the system has not been operated consistently with respect to the current operating plan such that the actual closure of dropshaft gates and the operation of the RAPS pumps are not consistently operated according to the proper operating parameters.

A future conditions model will be developed for the full 52-year period of record. This will require the incorporation of the interceptor modifications east of RAPS as currently in the design by MWRDGC. Once this is accomplished, the future conditions model will be run with the McCook reservoir on-line, including the authorized stage 2 reservoir and the two additional lagoons added by MWRDGC as a betterment. The future conditions model will be run for two dropshaft conditions: an open dropshaft condition and a closed dropshaft condition (until pressurization occurs).

A CH3D hydraulic model of Bubbly Creek is required to generate the velocities, stages, residence, and mixing predictions needed to evaluate sediment capping measures for erosion control. The CH3D model will also provide hydrodynamic input for the CE-QUAL-ICM water quality model. Tasks associated with the development of the hydraulic model include gathering existing bathymetric data, pumping data, and water surface elevation gage data. Velocity and water elevation data will be collected at three locations along Bubbly Creek for model calibration and validation. Data should be collected during two pumping events of differing magnitude and provide a time history of velocity and water elevation for a 12-24 hour period. It is assumed that MWRD would collect necessary field data. Input files would be developed, initial calibration for maximum pump rate scenario performed, and velocity data for sediment cap design provided. Alternative cap designs would be simulated; assume four capping alternatives would be modeled. A report would be prepared documenting the hydraulic modeling and alternative analyses.

The GTRAN model, linked with the CH3D hydrodynamic model output for Bubbly Creek, is required to determine sediment capping stability under various hydrodynamic scenarios. The GTRAN model is specifically designed to quantify sediment stability and transport rate at each cell in the hydrodynamic grid. This data will then be interpolated to estimate stable cap grain size (or grain size distribution) variation over the Bubbly Creek sediment bed. This effort does not assess cap stability relative to the underlying sediments; geotechnical evaluations are needed to assess cap stability relative to the underlying sediments, address slope stability, bearing capacity, settlement and filtering requirements as outlined in Sub-Account 22K Geotechnical Studies below.

A calibrated Integrated Compartment Model (ICM) Water Quality Model is required to evaluate cap requirements to control contaminant and nutrient fluxes from the sediment to provide suitable conditions for long-term water quality given control of surface discharges and channel residence times. This study requires sediment flux estimates, predictions of the effects of gas generation, and water quality data for calibration as laid out in Sub-account 22E Environmental Resources Study. It is assumed that representative pumping data and discharge water quality is available. Water quality simulations would be run for representative baseline conditions and cap designs. A report would be prepared documenting the water quality modeling and alternative analyses.

A report containing the results of hydrologic, hydraulic, erosion, and structural design analysis will be prepared for inclusion in the Hydrology and Hydraulics Engineering Appendix to the Feasibility Report. The report will contain information concerning design, analysis and computer simulations. The designs and report shall be in sufficient detail for the development of costs associated with those elements.

This task requirement is:

Federal Costs	TOTAL:	$422,200
Chicago District Labor:		
Technical Services Div.	3 workdays	$3,600
Design Branch	11 workdays	$11,000
Hydraulics & Environmental Eng. Section (HH)	122 workdays	$97,600
Miscellaneous Costs:		
Contractual H&H Analyses		$160,000
Other Corps (ERDC-WES)		$150,000
Non-Federal Costs	TOTAL:	$10,400
City of Chicago Labor:		
Department of Environment	8 workdays	$5,200
Department of Water Management	8 workdays	$5,200
TASK SUB-ACCOUNT 22J	**TOTAL:**	**$432,600**

Geotechnical Studies - (Sub Account 22K)

An initial investigation of the project area will be performed at a general level of detail, based on geologic and soil information obtained through secondary data sources (available existing subsurface data from local, state and federal sources) and will be added to the Project Geographic Information Systems (GIS) database for analysis. Laboratory tests are needed to determine the engineering properties of the organic sediments; specific interest in determination of the undrained shear strength and deformation characteristics of the deposits. Sampling should recover undisturbed samples from 5-inch diameter Shelby tubes at six critical locations along Bubbly Creek. At each location, two undisturbed samples should be retrieved from depths of about one-third and two-thirds of the total thickness of the deposit at that location. Unconsolidated undrained (UU or Q-tests) should be performed to assess the undrained shear strength where the samples were retrieved. The wet unit weight and water content of each sample will also be determined. After testing, the gradation (inc. hydrometer), specific gravity and Atterberg limits should be determined. Additionally, fixed-ring dredged material type consolidation tests should be performed on the undisturbed sample obtained from the same locations to help evaluate the settlement and consolidation rate of the organic deposits. Estimated a total of 15 borings required.

Additional field tests are recommended to improve the interpretation of the stratigraphy and strength characteristics of the organic deposits. These tests would include field vane shear testing and cone penetrometer testing. The field vane tests should be performed in boreholes and disturbed sample should be recovered so that Atterberg Limits at the field vane locations can be adjusted for the plasticity index. These tests would serve to improve the evaluation of the variation of the subsurface

conditions at the site and would result in improved confidence in the cross-sections and material properties used in the analysis.

A slope stability analysis will be performed on six critical cross-sections along the creek. The analysis will include the layout and development of each cross-section based on data from all available soil borings, laboratory tests, and field data including hydrographic data. The stability for each section will be evaluated based on three different cap designs. A one-dimensional consolidation analysis should be performed on each of the critical sections used in the stability analysis for three cap designs to determine rate of settlements and the potential for extremes in differential settlement that has the potential to disrupt proper functioning of the sand cap layer. The same cross-sections used in the stability analysis will be studied in the consolidation analysis.

A report containing the results of the Geotechnical investigations regarding sediment properties and depths, subsurface soil stratigraphy, and physical and engineering properties will be prepared for inclusion in the Geotechnical Engineering Appendix to the Feasibility Report. This information will be presented for the alternatives as well as the recommended plan, and will contain sufficient detail to support the geotechnical analysis and designs of the alternatives and the recommended plan to be performed as part of the Engineering Analysis and Design.

The Geotechnical Engineering portion of the Engineering Appendix will include: Regional and Local Geology and Groundwater Conditions, Geotechnical Considerations of the Alternatives, Geotechnical Analyses of the Recommended Plan (including: bearing, stability, settlement, seepage), foundation design, material utilization, dewatering and diversion, construction sequencing considerations, and recommendations for additional requirements during development of Plans & Specifications.

This task requirement is:

Federal Costs	TOTAL:	$336,600
Chicago District Labor:		
Technical Services Div.	3 workdays	$3,600
Design Branch	6 workdays	$6,000
Geotechnical Engineering Section	95 workdays	$95,000
Miscellaneous Costs:		
Contractual Subsurface Inv. & Soils Labs		$172,000
Other Corps (ERDC-WES)		$60,000
Non-Federal Costs	TOTAL:	$32,050
City of Chicago Labor:		
Department of Environment	7 workdays	$4,550
Miscellaneous Costs:		
Contractual Services		$27,500
TASK SUB-ACCOUNT 22K	**TOTAL:**	**$368,650**

Hazardous Toxic Radioactive Waste (HTRW) Studies- (Sub-Account 22L)

Phase I HTRW, Phase II HTRW, and sediment investigations will be conducted in accordance with the guidance provided in ER 1165-2-132: Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects, ER 1165-2-132: Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects, ASTM Standard E 1527-00 - Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, and ASTM Standard E1903: Phase II Environmental Site Assessment Process.

A Phase I HTRW report will be prepared that identifies recognized environmental conditions within and nearby the project study area that indicate a potential for upland HTRW contamination. An evaluation of potential for impacts of these sites to the project will be conducted. The report will include findings from a site reconnaissance; review of facility and regulatory agency records and databases; review of available mapping and aerial photography; and interviews with landowners, knowledgeable individuals, and regulatory agencies. A similar process will be used to evaluate potential disposal sites, if they are required, once they have been chosen. During this process, any borrow or disposal sites identified as having a potential for HTRW contamination will be excluded from consideration as a borrow or disposal area. The location of all known, reported, or suspected HTRW sites will be documented in the Phase I HTRW report. The City of Chicago will be responsible for developing the scope of work, negotiating, and administrating the Phase I HTRW contract.

If necessary, limited upland Phase II HTRW investigation(s) will be performed in upland project areas where the Phase I investigation indicates a potential for HTRW. A Phase II investigation will confirm or deny the presence of HTRW in upland project areas where no previous sampling has been conducted. The results of the investigation will be documented in a Phase II HTRW report. If necessary, the City of Chicago will be responsible for developing the scope of work, negotiating, and administrating a Phase II HTRW contract.

Sampling on privately owned land requires a right-of-entry agreement from the affected landowner. If a right-of-entry cannot be secured, the property will be noted for either follow-up HTRW investigation prior to construction or removed from consideration during the planning when formulating the recommended plan based upon the potential for HTRW presence.

Additional sediment investigations will be completed to supplement previous investigations; additional sediment investigations will be tailored support development and impact analysis of particular ecosystem restoration measures that are related to capping sediment, or sediment removal, and handling, and disposal. Coordination regarding sediment quality will be completed with USEPA and IEPA to determine whether remediation falls under other federal jurisdiction that would impact the study.

Additional coordination with USEPA and IEPA will be completed to determine what portion, if any, of the water quality impairments in the South Fork of the South Branch of the Chicago River are local responsibilities in accordance with the Clean Water Act standards. Development of ecosystem restoration measures to improve water quality in the River and labor costs associated with this work are further described in Sub account 22R, Plan Formulation.

All Phase I HTRW, Phase II HTRW, and sediment investigations will be included as part of the NEPA document and presented in an environmental engineering appendix to the Feasibility Study.

This task requirement is:

Federal Costs	TOTAL:	$125,400
Chicago District Labor:		
Technical Services Div.	1 workdays	$1,200
Design Branch	3 workdays	$3,600
Chief, Hydraulic & Env. Engineering	8 workdays	$8,000
Hydraulics & Environmental Eng. Section	47 workdays	$37,600
Miscellaneous Costs:		
Contractual Sediment Investigation		$75,000
Non-Federal Costs	TOTAL:	$129,100
City of Chicago Labor:		
Department of Environment	14 workdays	$9,100
Miscellaneous Costs:		
Contractual Services		$50,000
Contractual Soil Investigation		$70,000
TASK SUB-ACCOUNT 22L	**TOTAL:**	**$254,500**

Surveying and Mapping-(Sub-Account 22N)

Existing aerial and topographic survey data will be utilized if the data meets project study team requirements. Updated aerial and topographic survey data will be obtained where necessary. All surveying activities will be performed in accordance with EM 1110-2-1000, EM 1110-1-1003, ER 1110-1-1003, and EM 1110-1-1005. Utility data and real estate information will be collected for all project areas where dredging, disposal, and/or restoration is proposed for the project. The City of Chicago and their contractor will perform this work.

GIS information for the Chicago River Basin will be compiled in a GIS database. All new and existing data obtained for this feasibility study will also be included in the GIS database. New and existing data will include, but not be limited to, the following information: sediment quality data, probing locations, sediment thickness at probing location, water quality data, land use information, topography, municipal information, wetland delineation, real estate mapping, HTRW sites in the region, utility identification, and infrastructure that may be impacted upon by dredging/disposal operations. The GIS database will be utilized in the formulation and analysis of project measures and alternatives. Using the GIS database, a 3-D physical model of the recommended plan will be created for display at coordination and public meetings. Development of the database will be coordinated with all appropriate Chicago District sections and non-Federal sponsor(s) disciplines taking part in the feasibility study.

The City of Chicago and their contractor is responsible for verifying all exiting utilities and utility maps for incorporation into alternative designs and layouts and to identify utility relocations for the recommended project sites. This activity may require close coordination with several utility owners. Utility locations, easements, and relocations will be incorporated into the Real Estate drawing to also establish work limits and additional land acquisition requirements prior to preparation of the PMP for the Preconstruction Engineering & Design (PED) Phase.

City of Chicago and their contractor responsibilities also include identifying property ownership, title and record search, real estate mapping, and legal descriptions required for land acquisition and project design and construction. A preliminary Real Estate map will be prepared for the Feasibility Report anticipating initiating preparation of plans and specifications upon issuing the Division Engineer's Notice and execution of the Preconstruction Engineering and Design Agreement with the non-Federal sponsor(s).

The City of Chicago will be responsible for developing the scope of work, negotiating, and administrating the needed surveying contract. It is anticipated that a contract will be required for obtaining aerial, topographic, hydrographic and utility data.

This task requirement is:

Federal Costs	TOTAL:	$11,200
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	0 workdays	$0
Planning Branch (GIS)	1 workdays	$1,000
Technical Services Div.	0.5 workdays	$600
Design Branch	0.5 workdays	$600
Chief, Civil Design Section	2 workdays	$2,000
Civil Design Engineer	5 workdays	$4,000
CADD Technician	0 workdays	$0
Geotechnical Engineering Section	3 workdays	$3,000
Non-Federal Costs	TOTAL:	$124,500
City of Chicago Labor:		
Department of Environment	10 workdays	$6,500
Miscellaneous Costs:		
Contractual Services		$58,000
Contractual Survey		$50,000
Contractual 3D Display Model		$10,000
TASK SUB-ACCOUNT 22N	**TOTAL:**	**$135,700**

Engineering Analysis and Design /Project Cost Estimate- (Sub-Account 22P)

An Engineering Appendix will be prepared that support the alternative analyses and the recommended plan as shown in the Feasibility Report. The Engineering Appendix will be prepared at a level of detail necessary to develop a defensible baseline cost estimate that addresses all pertinent cost factors with adequate contingency factors. The Engineering Appendix will document the results of all of the engineering investigations conducted during the feasibility phase, including: surveying and mapping, hydrology and hydraulics studies, geotechnical investigations, site investigations, design analyses, quantity estimates, and preliminary and final cost estimates. The Engineering Appendix will be prepared by the Technical Services Division and will be scheduled for completion in time to be incorporated into the draft Feasibility Report.

The Civil Design portion of the Engineering Appendix will include plates showing the site and the recommended alternative. It will also include work limits, temporary and permanent easements, haul routes, staging and storage areas, borrow and disposal sites, and quantity estimates.

The Technical Services Division will prepare initial cost estimates for the alternatives considered in the feasibility phase. These cost estimates will be provided to the economist to be used in the CE/ICA. After a plan has been selected, an estimate will

be prepared for the construction and implementation costs using Microcomputer Aided Cost Engineering System (MCACES) procedures for the recommended plan. These estimates will be the total cost (Federal and non-Federal) of implementing the project, including construction costs, lands, easements, rights-of-way, relocations, disposal areas, mitigation, engineering and design, and construction management. Detailed first and annual cost estimates, including operation and maintenance, inspection plan, interest during construction, and replacement costs will be developed for the selected plan. A narrative basis of estimate will be prepared and included in the engineering appendix.

Preliminary drawings of project features will be developed for the in-stream habitat features, fill and/or capping material locations, dredging locations, hydraulic/geotechnical structures, and ecosystem restoration locations. Preliminary drawings will be utilized to evaluate the alternatives and to provide a foundation for the detailed design of the final plan.

Designs will be developed for the elements of the selected plan, for the purposes of plan illustration, as well as an aid in the development of the baseline cost estimate. Final Drawings will be prepared during the Preconstruction Engineering Design (PED) phase following the completion of the Feasibility Study phase. A report containing the results of the design analyses, as well as the preliminary and detailed designs and drawings, will be prepared for inclusion in the Civil Design Appendix. This information will be presented for the alternatives as well as the selected plan. The report will contain sufficient detail for the development of costs associated with these elements.

This final cost estimate includes all deliverables required to prepare life cycle cost estimates needed to support the Feasibility Report and to prepare the baseline project cost estimate. Cost estimates will be developed in accordance with the guidance contained in ER 1110-2-1302, Civil Works Cost Engineering, using the MCACES / MII cost estimating system. Cost estimates will be presented in the Civil Works Breakdown Structure (CWBS). Cost estimates will include both Federal and non-Federal costs for construction; real estate; engineering and design; construction management; environmental, cultural resources; HTRW investigations; operation and maintenance; replacement, repairs and rehabilitation of alternatives; and the recommended project. Revisions to the estimates prepared for the draft report and comparative cost estimates used for alternative analysis will also be included. In addition, this product will include an estimate of the cost of the preparation of the cost estimate updated during the PED phase.

This task requirement is:

Federal Costs	TOTAL:	$81,000
Chicago District Labor:		
Technical Services Div.	1.5 workdays	$1,800
Design Branch	4 workdays	$4,800
Chief, Civil Design Section	9 workdays	$9,000
Civil Design Engineer	31 workdays	$24,800
Cost Engineer	35 workdays	$28,000
CADD Technician	18 workdays	$10,800
Miscellaneous Costs:		
Chicago District CADD Services		$1,800
Non-Federal Costs	TOTAL:	$0
City of Chicago Labor:		
Department of Environment	0 workdays	$0
TASK SUB-ACCOUNT 22P	**TOTAL:**	**$81,000**

Feasibility Study Management – (Sub-Account 22Q)

Feasibility Study Management costs include: daily overall management of work activities on the study, preparing progress reports, preparing budgetary documents, reviewing expenditures, and reviewing the technical reports generated by the various technical elements.

The purpose of the PMP is to present a plan for investigating, developing and evaluating ecosystem restoration alternatives for Bubbly Creek, South Fork South Branch (SFSB) of the Chicago River. The PMP describes the scope, schedule, and budget of the tasks required to develop, initiate, and complete the Feasibility Study. A detailed work task description cost summary table, work break down structure, division of responsibilities and preliminary schedule is included.

The Study Manager (SM) will closely monitor the progress of technical investigations in accordance with the PMP and ensure that the study complies with the provisions of ER 1165-2-501, Civil Works Ecosystem Restoration Policy (30 September 1999), and EP 1165-2-502, Ecosystem Restoration Supporting Policy Information (30 September 1999). All measures formulated during the feasibility study must demonstrate that the proposed restoration measures will result in restoration of unique and significant habitat. Restoration activities must result in measurable improvements to fish and wildlife habitat, and not solely water quality benefits.

An acquisition plan will be prepared that lists the procurement actions, contract amounts, and award schedule for Architect-Engineer (A-E) contracts to be used to complete the study. The cost of obtaining A-E services are included in the study cost

estimates of the technical study sub-products. Each technical discipline is responsible for preparation of negotiation, award, and contract administration documents for the utilization of A-E contractors to complete, or assist in the completion of Feasibility Phase products for their respective disciplines.

In accordance with ER 1110-1-12, Engineering and Design Quality Management, the Project Manager, Study Manager, and product leads will prepare a Quality Control Plan (QCP) for executing each engineering product. The plan will include discussion on the conduct of the Independent Technical Review (ITR); customer requirements and expectations; technical criteria; technical and policy design quality verification procedures; schedule; and compliance checklists for quality control reviewers.

This task requirement is:

Federal Costs	TOTAL:	$77,000
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	5 workdays	$6,000
Planning Branch	12 workdays	$12,000
Environmental & Social Analysis Section	40 workdays	$32,000
Programs & Project Management Branch	22 workdays	$22,000
Miscellaneous Costs:		
Travel and Vehicle Costs		$5,000
Non-Federal Costs	TOTAL:	$9,750
City of Chicago Labor:		
Department of Environment	15 workdays	$9,750
TASK SUB-ACCOUNT 22Q	**TOTAL:**	**$86,750**

Plan Formulation - (Sub-Account 22R)

A Study Manager (SM) will be assigned from the Planning Branch to manage the day-to-day plan formulation and report preparation effort. The SM will lead the study team, including coordinate the plan formulation process among the various disciplines and organizations. Management of the plan formulation effort will include such activities as planning and conducting team meetings, upward reporting, preparation of study and project management documents, coordination with the non-Federal sponsor(s) and other agencies, and integration of all technical investigations.

Plan formulation involves the development and evaluation of alternative solutions to the problems identified during the Reconnaissance Study and refined during the Feasibility Study. The Study Manager will lead the investigation into identifying possible restoration measures that address the identified problems and opportunities

within the Bubbly Creek study area. Measures will include those identified, screened, and retained during the reconnaissance study, including measures that will restore in-channel habitats, restore wetland habitats, restore riparian habitats, reduce stagnant flow conditions, enhance water quality, and identify compatible recreation features, along with any other new measures that can be formulated to address the identified problems and opportunities while meeting study objectives and avoiding constraints.

Ecosystem restoration measures and alternatives will be developed, screened, and analyzed for the South Fork South branch Chicago River (in-stream) as well as for areas adjacent to the bank. Restoration alternatives for specific sites will be designed to sufficient detail in order to develop construction estimates needed to rank alternatives and select a recommended plan. Design elements will include engineered features that would: restore low flows to Bubbly Creek during normal periods; eliminate combined sewer overflow discharges; reduce contamination from bottom sediments; and restore aquatic and terrestrial habitats. Upon completion of the recommended plan analysis and environmental assessment, a report will be prepared as required by the Clean Water Act, (CWA) which summarizes any water quality impacts associated with the placement of fill in waters of the United States. Through appropriate guidance from IEPA, either a Water Quality Certification or waiver will be obtained during the Feasibility Study or during the Preconstruction Engineering & Design (PED) phase.

Innovative measures that have not been utilized in similar environmental conditions may require laboratory or field-scale tests to determine the applicability, practicality, and magnitude of ecosystem benefits achieved. The non-Federal sponsor(s) in conjunction with the USACE, will conduct these analyses. The City of Chicago is currently pursuing a demonstration project to determine the viability of capping sediments within Bubbly Creek. Several tasks associated with this demonstration project are necessary for the completion of this feasibility study and are laid out in the Environmental Resources Study sub-account 22E and Geotechnical Studies sub-account 22K.

The plan formulation process will follow the six-step process defined in the Principles and Guidelines (P&G) adopted by the Water Resource Council, ER 1105-2-100, and the guidelines for conducting ecosystem restoration studies provided in EC 1105-2-210. The six steps are:

Step 1 – Identifying problems and opportunities
Step 2 – Inventorying and forecasting conditions
Step 3 – Formulating alternative plans
Step 4 – Evaluating alternative plans
Step 5 – Comparing alternative plans
Step 6 – Selecting a plan

The study team will characterize both baseline and projected future without project conditions within the study area that will be used as a basis to compare the

proposed restoration alternatives and their ecosystem outputs for project justification. An evaluation tool and procedure used to quantify the ecosystem outputs of proposed restoration measures will be developed. The evaluation procedure selected will be based upon established assessment tools that have been successfully utilized in similar environments. The evaluation procedure will be reviewed and concurred upon by USACE Headquarters prior to the development of the final array of restoration alternatives. The implementation costs, ecosystem benefits, and cumulative benefits of each identified restoration measure will be evaluated and assessed. The SM will perform a cost effectiveness and incremental cost analysis (CE/ICA) of each restoration alternative and evaluate "best-buy" plans using IWR-PLAN Decision Support Software.

Plan formulation is an iterative process that involves formulating, evaluating, comparing, and re-formulating plans until an array of unique alternatives that meet the identified objectives within constraints are determined. The SM is responsible for all plan formulation activities, detailed analyses required to develop the final array of alternatives, and identification of the National Ecosystem Restoration (NER) recommended plan that complies with floodplain and water quality permitting requirements and all applicable statutes, executive orders, memoranda, and policies. Details and results of the plan formulation process will be documented in a Plan Formulation appendix to the Feasibility Report. A summary of the plan formulation process as documented in the Plan Formulation Appendix will be incorporated into the Feasibility Report as the main report section.

This task requirement is:

Federal Costs	TOTAL:	$258,200
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	6 workdays	$7,200
Planning Branch	30 workdays	$30,000
Economic & Plan Formulation Section	33 workdays	$26,400
Environmental & Social Analysis Section	160 workdays	$128,000
Technical Services Div.	2 workdays	$2,400
Design Branch	5 workdays	$6,000
Chief, Hydraulic & Env. Engineering	11 workdays	$11,000
Hydraulic & Env. Engineering Section (HH)	15 workdays	$12,000
Hydraulic & Env. Engineering Section (HE)	44 workdays	$35,200
Non-Federal Costs	TOTAL:	$35,750
City of Chicago Labor:		
Department of Planning	20 workdays	$13,000
Department of Environment	30 workdays	$19,500
Mayor's Office	5 workdays	$3,250
TASK SUB-ACCOUNT 22R	**TOTAL:**	**$293,950**

Feasibility Report Preparation - (Sub-Account 22S)

Feasibility report preparation activities will include generating the draft and final Feasibility Report and NEPA documentation, team, ITR, peer review, and compliance reviews of reports submitted by the Chicago District and non-Federal sponsor(s), and reproducing reports for agency and public distribution. The District's Planning Branch is responsible for assembling the Feasibility Report. Technical reports, described in other task elements in this PMP, will be included as appendices to the Feasibility Report. Feasibility Report costs include those needed to prepare main text, figures, and design plates. The costs of preparing the draft NEPA document, technical appendices required to complete the Feasibility Report. The costs of preparing quantity calculations, preliminary cost estimates, and MCACES / MII cost estimates are included under other tasks.

A draft Feasibility Report and draft NEPA document will be prepared following the guidance contained in ER 1105-2-100. Preparation of the draft Feasibility Report includes assembling, writing, editing, typing, drafting, reviewing, reproducing, and distributing the draft report, draft NEPA document and other related documentation required for transmittal by USACE to higher authorities for use as a decision document that supports a decision for construction authorization for implementation of a candidate project. The contents of the draft Feasibility Report are summarized below:

- A concise main report that includes the study's technical findings, conclusions, and recommendation that confirms or denies the interest in the Corps of Engineers' implementation of a candidate project;
- A draft NEPA document;
- Technical appendices presenting the detailed backup and results of individual tasks;
- An appendix containing the sponsor's financial capability statement and preliminary financing plan;
- Microcomputer Aided Cost Estimating System (MCACES / MII) estimate for the recommended plan; and
- Other supporting documentation including the Project Management Plan (PMP) for the Preconstruction and Engineering Design (PED) Phase.

Prior to preparation of the draft Feasibility report, a minimum of two compliance reviews, including a Feasibility Scoping meeting (FSM) and an Alternative Formulation Briefing (AFB) must be completed. The FSM and AFB are required interim checkpoint conferences attended by the Chicago District, the non-Federal sponsor(s), the Great Lakes and Ohio River Division (CELRD), and Headquarters (HQUSACE). The purpose of the FSM is to review study findings concerning goals and objectives; problem and opportunities; and baseline and future without project conditions. The purpose of the AFB is to review study findings concerning measures formulated to address ecosystem problems and opportunities; to evaluate the array of alternatives and determine their consistency with the Federal interest; and to review the preliminary analysis of the environmental, economic, social and regional impacts of alternatives. The AFB will be scheduled when technical studies, such as hydrologic modeling and baseline environmental investigations, have progressed to the point where a determination can be made on whether potential alternatives are in the Federal interest. The Study Manager (SM) and Project Manager (PM) are responsible for scheduling and providing all materials required for these reviews.

The Study Manager will assemble the Final Feasibility Report and Final NEPA document. The costs of preparing the final NEPA document and the technical appendices are included under Sub-Accounts. The Final Feasibility Report will incorporate comments from agencies, the public, and higher authority USACE review. The steps in producing a Final Feasibility Report include the following:

- Finalize draft Feasibility Report for internal/sponsor PDT Team review;
- Revise and reproduce draft report for submission to LRD and HQUSACE;
- Revise draft report in response to LRD and HQUSACE comments;
- Modify draft report in response to comments during agency and public comment review;
- Develop a preliminary project design as a basis for preparing a Design Documentation Report (DDR), if necessary, and plans and specifications;
- Reproduce Final Feasibility Report for distribution.

The PDT will perform reviews of the draft and Final Feasibility Report in accordance with the project and District Quality Control Plans (QCPs). Each Product Team (PT) is responsible for producing quality services and/or products. Methodology, concurrence, technical adequacy, and product quality (i.e., format, grammar, spelling, consistency, computations, etc.) are obtained through periodic internal reviews by the product team members and technical supervisors. Appropriate review documentation, including checklists and/or comments, will be provided to the Quality Manager (QM) subsequent to the team review.

The Independent Technical Review (ITR) is intended to be on going throughout product development, using a team concept, not a cumulative process performed at the end. The ITR team will perform an adequacy and policy compliance review of the Feasibility Report. The particular aspects of the Feasibility product on which the ITR team will concentrate its focus include the following technical and policy criteria: conformance to basic planning principles relative to the identification, evaluation, and recommendation of project plans. Technical reviews will be performed by a combination of independent experts within USACE, other Federal agencies, private consultants, and/or the non-Federal sponsor(s). Documentation, as outlined in the District Quality Management Plan (QMP) and the QCP for the feasibility study will be provided by the Study Manager. Policy compliance reviews are completed at the USACE Division and Headquarter levels and are intended to resolve policy concerns that might otherwise delay or preclude approval of the Feasibility Report.

A public notice will be prepared announcing completion of the Division Commander's Report, based on his endorsement of the findings and recommendations of the District Commander, and indicate that the report has been submitted for Washington Level Review. The Planning Branch will perform this function.

This task requirement is:

Federal Costs	TOTAL:	$156,800
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	4 workdays	$4,800
Planning Branch	8 workdays	$8,000
Economic & Plan Formulation Section	20 workdays	$16,000
Environmental & Social Analysis Section	85 workdays	$68,000
Programs & Project Management Branch	20 workdays	$20,000
Miscellaneous Costs:		
USEPA	14 workdays	$14,000
Other Corps (ITR Team)	26 workdays	$26,000
Non-Federal Costs	TOTAL:	$9,750
City of Chicago Labor:		
Department of Planning	3 workdays	$1,950
Department of Environmental	3 workdays	$1,950
Department of Legal	3 workdays	$1,950
Mayor's Office	3 workdays	$1,950
Department of Water Management	3 workdays	$1,950
TASK SUB-ACCOUNT 22S	**TOTAL:**	**$166,550**

Programs and Project Management - (Sub-Account 22T)

This task included macro-level tracking, monitoring and upward reporting of the study progress by the Programs and Project Management Branch. The costs included the preparation of budget justification information and tracking of obligation and expenditures for each fiscal year.

The Chicago District Project Manager (PM) will monitor expenditures, keep the PMP current, prepare project management reports, report to the Chicago District Project Review Board (PRB), report to the Executive Steering Committee (ESC), and report study status and issues to the District Commander. The project management structure will continue into the Preconstruction Engineering and Design (PED) and Construction phases. Updates of PMP will include regular finance and accounting reports regarding expenditures and obligations, executive summary reports for the PRB, schedule and cost changes, and changes to work elements.

The PM will ensure that all required tasks and coordination are performed in accordance with the PMP and FCSA. Budget preparation, correspondence, inter-organizational coordination, and point-of-contact responsibilities are part of project management. Duties such as assigning and negotiating study tasks to technical elements, scheduling the study, coordinating between technical elements, monitoring and modifying assigned work items as required, and reviewing results and reports provided

by the technical support staff and preparing and responding to technical correspondence are also the responsibility of the Project Manager

Copies will be made of letters exchanged with the non-Federal sponsor(s) that affect study costs, scopes of work and/or schedules; official correspondence with higher authority on similar subjects; internal memoranda which bear on significant study elements; and, in general, any other correspondence which affects significant aspects of the study. This task will be performed by the Planning, Programs and Project Management Division.

This task requirement is:

Federal Costs	TOTAL:	$58,400
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	7 workdays	$8,400
Programs & Project Management Branch	50 workdays	$50,000
Non-Federal Costs	TOTAL:	$13,000
City of Chicago Labor:		
Department of Environment	20 workdays	$13,000
TASK SUB-ACCOUNT 22T	**TOTAL:**	**$71,400**

Initial Draft PCA and PED Agreement - (Sub-Account 22V)

A draft Project Cooperation Agreement (PCA) for implementation of the recommended plan will be developed during the final stages of the feasibility study process. The PCA is a legal binding agreement that sets forth the cost sharing requirements (including credits for LERRDs and work in kind if applicable), non-Federal sponsor(s) responsibility for obtaining all LERRDs required for the project, shall provide and terms of the relationship between the Federal Government and the non-Federal sponsor(s) for construction, operation and maintenance of the project. The PCA will be finalized during Preconstruction Engineering & Design (PED) phase.

The purpose of the PED phase is to complete all of the detailed technical studies and design needed to begin construction of the project. The PED Agreement will include all Federal and non-Federal costs for PED from the date of the Commander's Notice to award of the first construction contract. PED activities may begin after negotiating and executing the PED Agreement. The non-Federal sponsor(s) will initially provide 25 percent of the PED costs after execution of the PED Agreement. Through execution of the Project Cooperation Agreement (PCA), the non-Federal sponsor(s) share of the PED costs will be adjusted to provide 35 percent of the PED costs. The non-Federal sponsor(s) will provide any additional funds required to cover their 35 percent share of the PED costs during construction. A draft PED agreement will be developed during the

final stages of the feasibility study process and coordinated with the non-Federal sponsor(s) and the Corps review levels as appropriate. The PED agreement will be finalized after project authorization.

An allocation of funds table will be prepared that includes the allocation of funds for each feature, programmed by Fiscal Year (FY), and separated by non-Federal and Federal sponsors. This table outlines cash flow for each partner for project purposes. See ER 1165-2-131, ER 11-2-240, and appropriate Project Management guidance letters. The Planning, Programs and Project Management Division will perform this task.

This task requirement is:

Federal Costs	TOTAL:	$34,400
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	2 workdays	$2,400
Planning Branch	4 workdays	$4,000
Environmental & Social Analysis Section	10 workdays	$8,000
Programs & Project Management Branch	20 workdays	$20,000
Non-Federal Costs	TOTAL:	$13,650
City of Chicago Labor:		
Department of Planning	5 workdays	$3,250
Department of Environment	9 workdays	$5,850
Department of Legal	2 workdays	$1,300
Mayor's Office	5 workdays	$3,250
TASK SUB-ACCOUNT 22V	**TOTAL:**	**$48,050**

Washington Level Review - (Sub –Account 22Y)

This task includes activities necessary for submittal of the Final Feasibility Report to Congress after completion of all levels of review. To ensure that the non-Federal sponsor(s) is afforded an opportunity to participate in any significant effort as a result of Washington level review including the Civil Works Review Board (CWRB), funding for the District and the non-Federal sponsor(s) are included as a separate work item in the PMP. These costs, including any necessary travel to USACEHQ, will be limited to those reasonable costs associated with the review and processing of the Feasibility Report. In accordance with EC 1105-2-108, this item will be 5 percent of the total study cost or $50,000, whichever is less, and will be cost-shared equally between the Corps of Engineers and the non-Federal sponsor(s). Accordingly, $50,000 is included in the estimate for this task.

A written assessment of the Final Feasibility Report will be prepared by the Civil Works Review Board (CWRB) to document the Feasibility Report's compliance with

current policy. This task will be performed by HQUSACE and will be funded through separate appropriations.

A brief summary of the Feasibility Report, signed by the Chief of Engineers, will be prepared to transmit recommendations to the Assistant Secretary of the Army for Civil Works (ASA-CW). This task will be performed by HQUSACE and will be funded through separate appropriations.

A letter will be prepared from The President's Office of Management and Budget (OMB) to the ASA-CW expressing the Administration's position regarding transmitting the report to Congress for authorization. This task will be performed by OMB and will be funded through separate appropriations.

A letter will be prepared from ASA-CW transmitting the Feasibility Report along with their recommendation to Congress. This task will be performed by ASA-CW and will be funded through separate appropriations.

This task requirement is:

Federal Costs	TOTAL:	$25,000
Miscellaneous Costs:		
Washington Level Review Funds Allocation		$25,000
Non-Federal Costs	TOTAL:	$25,000
Miscellaneous Costs:		
Washington Level Review Funds Allocation		$25,000
TASK SUB-ACCOUNT 22Y	**TOTAL:**	**$50,000**

Peer Review Plan - (Sub –Account 22Z)

This task includes activities necessary to complete the peer review plan, coordinate the peer review plan with the National Ecosystem Restoration Planning Center of Expertise (ECO-PCX), and coordinate for completion of an external peer review (EPR) in accordance with EC 1105-2-408. The peer review plan will be published on the web and will contain all of the information required in paragraph 6 of EC 1105-2-148. Where applicable, ECO-PCX will lead in developing and managing an external peer review team consisting of subject matter experts that will review the scientific and engineering information, assumptions, and use of models for project features that are novel, controversial, precedent setting, have significant interagency interest, or have significant environmental, economic or social effects to the nation.

This task requirement is:

Federal Costs	TOTAL:	$57,000
Chicago District Labor:		
Planning, Programs, Project Mgmt Div.	0 workdays	$0
Planning Branch	1 workdays	$1,000
Environmental & Social Analysis Section	5 workdays	$4,000
Programs & Project Management Branch	2 workdays	$2,000
Miscellaneous Costs:		
Nat. Ecosystem Restoration PCX (ECO-PCX)		$50,000
Non-Federal Costs	TOTAL:	$0
City of Chicago Labor:		
Department of Planning	0 workdays	$0
Department of Environment	0 workdays	$0
TASK SUB-ACCOUNT 22Z	**TOTAL:**	**$57,000**

E. FEASIBILITY COST SHARING REQUIREMENTS

According to Section 105(a)(1) of the Water Resources Development Act of 1986, the cost of a subsequent feasibility phase to be shared equally (50/50) between the Federal sponsor and the non-Federal sponsor (City of Chicago). A portion of the non-Federal sponsor share will be in-kind products and services. The remainder of the non-Federal sponsor share will be in cash form. In-kind services are those tasks performed or paid for by the non-Federal sponsor, which are in direct support of the Feasibility Study effort. While all in-kind services should be in support of the particular study, it is permissible for the non-Federal sponsor to reorient existing programs and on-going work to complement the USACE Feasibility Study. The determination of the dollar value of in-kind products or services has been negotiated between the Corps of Engineers and non-Federal sponsor. These dollar values were considered as fixed fee items and were based on a detailed government estimate and non-Federal sponsor proposal. Federal regulations, including Office of Management and Budget Circular A-87 were used when applicable.

To proceed with the feasibility phase, the Chicago District and the City of Chicago must agree that the proposed project is in the Federal and non-Federal interest and then negotiate a Feasibility Cost Sharing Agreement (FCSA) that commits both parties to equally sharing 50 percent of the feasibility phase costs. It sets forth the management structure, obligations of the signatories, methods of payment, resolution of disputes, methods for termination or suspension of the feasibility study, and other general contractual matters. The PMP is an addendum to the FCSA.

Federal funds to initiate the feasibility phase may be allocated only after a negotiated FCSA has been prepared and all documents certified by USACE higher authority. The feasibility phase can then begin after execution of the FCSA and receipt of both Federal and non-Federal funds.

Supervision and Administration

The Chicago District will be responsible for costs resulting from general supervision and administration in conducting the study. For the Chicago District, this is a general overhead expense and will be applied to the study using the administrative and departmental overhead rates for Chicago District hired labor. These rates are adjusted periodically. This PMP estimate is based on an effect rate of 55.85%, General and Administrative overhead rate of 19.47% and consolidated departmental overhead rate of 44.16% that were effective as of May 2007.

Study Costs and Schedules

Currently, the cost of the feasibility phase is estimated at $2,650,000. This will be cost shared (50-50) between the Federal Government and the non-Federal sponsor (City of Chicago). The feasibility phase includes the cost of detailed work items described in this PMP.

Attachment A – Summary of Costs by Sub-Account lists the study costs by activity and organization and ***Attachment B - Summary of Costs by Organization*** summarizes total study costs by organization. These attachments include the task to be accomplished; the organization, Federal or non-Federal, to perform the task; the time to perform the task; and the cost of that task. The costs are for hired in-house labor, contract with an Architect-Engineer firm (A-E), or contributed funds to another agency. Hired labor costs are estimated using the Chicago District's, May 2007, effective labor rates and technical elements' overhead rates. The work items to be performed or contracted by the non-Federal sponsor have been negotiated using the Government estimate as a basis of comparison.

Attachment C - Summary of Costs by Fiscal Year lists the study costs by organization and fiscal year based on the schedule of major activities shown in ***Attachment D - Schedule of Activities***.

Major Milestones

The major milestones for the feasibility study are shown in *Table 2* below. The baseline milestone dates were determined based on projected major activity durations developed by the PDT. These dates are intended to be a target and may change due to funding constraints, modifications to work items, or activities outside the control of the study team including permitting agency reviews and vertical team reviews. Modifications to the schedule and work items are described in the next section.

Milestone	Description	Baseline	Actual
Milestone F1	Initiate Study	Aug-2007	
Milestone F2	Public Workshop and NEPA Scoping	Mar-2008	
Milestone F3	Feasibility Scoping Meeting	Jul-2008	
Milestone F4	Alternative Formulation Briefing	Jul-2009	
Milestone F5	Draft Feasibility Report and EA or EIS	Jan-2010	
Milestone F6	Final Public Meeting	Mar-2010	
Milestone F7	Feasibility Review Conference	Nov-2010	
Milestone F8	Final Report to LRD	Dec-2010	
Milestone F9	DE's Public Notice	Jan-2011	
-	Chief's Report	Apr-2011	
-	Project Authorization	Aug-2011	

Table 2: Major Feasibility Study Milestones

Modifications

During the course of the study, modifications to work items may become necessary. Modifications generally cause changes to the cost and/or the completion schedule of study work items. The party performing the work item will notify product team leader and study manager as soon as the need for a modification becomes apparent.

Once the parties have concurred on the recommended alternative, a reevaluation of the requirements for the Feasibility Report will be completed. If necessary, the Feasibility Cost Sharing Agreement and the Project Management Plan will be renegotiated at that time.

Notification will be in writing and will include the work item(s) requiring modification, reason for the modification, and impacts on work item cost and/or schedule. If the modification does not increase the total cost of the work item by more than 15%, does not extend the completion schedule by more than 90 days, and does not reassign a work item between non-Federal sponsor and USACE; approval of the modification will be given by the project managers of the Project Delivery Team. The Executive Steering Committee (ESC) must approve any modifications that exceed these limits.

Modifications to the total study cost due to changes in overhead rates and effective salary rates are allowed upon written notification to the ESC membership.

Maintenance of Records

Records of expenditures during the feasibility study incurred by the District will be maintained using the Corps of Engineers Financial Management System (CEFMS). The Chicago District Project Manager will maintain the records of the Federal and non-Federal contributed funds. The non-Federal sponsor will also keep financial records of

expenditures incurred. The District Project Manager shall prepare periodic reports on the progress of all work items.

Documents pertaining to Architect-Engineering (A-E) contracts undertaken and administered by either USACE or non-Federal sponsor will be maintained by the respective party's project manager for review by the PDT. For the District, the documentation will be the Department of Defense Form 1155 and Scope of Work and Record of Payment, Eng Form 93. For non-Federal sponsor(s), comparable records shall be maintained.

Acquisition Selection Process

Contracts administered by USACE will be selected by a Source Selection Evaluation Board (SSEB) that will be comprised of multi-disciplinary representatives from contracting, environmental engineering, hydraulic engineering, geotechnical engineering, cost estimating, and legal departments, along with technical advisors selected depending on the work item to be contracted. Collectively, this team will be responsible for all significant aspects of the acquisition. A description of the various members and their role on the SSEB is described below.

(1) Source Selection Authority (SSA): The SSA will be responsible for making the source selection decision, as well as ensuring that the source selection process is conducted in accordance with the Source Selection Plan (SSP) and applicable regulations. The SSA will be responsible for approving the technical evaluation factors and will ensure that all source selection decisions are adequately documented.

(2) SSEB Chairperson: The Chairperson of the SSEB/Contract Specialist will be responsible for issuing the Solicitation, preparing pre-award documentation and the resultant contract consistent with the source selection plan and applicable regulations. This individual will act as the sole point of contact for performing the proposal compliance review, scheduling clarification exchanges (when necessary), and collecting past performance information. This individual will also be responsible for maintaining security, keeping the SSEB on schedule, and leading the evaluation and rating process. This individual will ensure that each member of the SSEB completes a Nondisclosure Certificate and an OGE 450 Certificate, if applicable, prior to the start of the evaluation process.

(3) Technical Evaluators: The Technical Evaluators will be responsible for rating and preparing written evaluations of each proposal in accordance with Section 00100 of the Solicitation and the developed SSP. Evaluations will be documented on "Proposal Rating Sheets," as exhibited in the developed SSP. Each Evaluator will state and document those areas of a proposal that failed to conform to the standards of the respective technical factors as well as any additional information that requires clarification. Each Evaluator will ensure impartial and comprehensive evaluation of

offerors' proposals. One representative of the non-Federal sponsor is allowed to serve as a technical evaluator. This representative must be a government employee directly employed with the City of Chicago.

(4) Chairperson, Technical Evaluators: The Chairperson for the Technical Evaluation Team (TET) will be responsible for the responsibilities outlined in paragraph (3) above as well as preparing a written report to be submitted to the SSA; the report will summarize the technical evaluation results and the rationale for the ranking of the firms following the price -technical trade-off analysis. This report will also contain a recommendation for clarifications if considered necessary.

(5) Cost/Price Evaluator: The Cost/Price Evaluator will be responsible for evaluating the price proposals in accordance with Section 00100 of the Solicitation and the developed SSP. Price will be evaluated for fairness and reasonableness through use of price analysis. Price will also be checked for unbalancing of line items. The TET will be available to assist the Cost Evaluators with the complexity of work, levels of effort required to accomplish the work and other information as required to complete the price analysis, as well as prepare a written report to be submitted to the TET; this report will summarize the cost/price evaluation results. This report will also contain a recommendation for clarifications, or obtaining pricing methodology, if considered necessary.

(6) Legal Advisor: The Legal Advisor will be responsible for reviewing all source selection and award documentation for legal sufficiency and providing legal services to other members of the SSEB as necessary to assist in fulfilling their responsibilities.

(7) Technical Advisors: Technical Advisors will be responsible for providing assistance to members of the Technical and Cost/Price Evaluation Teams. It is important to note that Technical Advisors do not have any authority to rate or vote on the acceptability of proposals; hence, Technical Advisors are non-voting members. These individuals will provide their expert opinions and advise other SSEB members when called upon. The non-Federal sponsor is allowed to appoint technical advisors to provide expert opinions and are not required to be a government employee directly employed with the City of Chicago.

The SSA, Chairperson of the SSEB, and individual Technical Evaluators, Cost/Price Evaluators, and advisors will be responsible for safeguarding proposal information and other source selection sensitive information and will execute the appropriate certifications and disclosure statements as necessary.

F. FUNDING SCHEDULE

The funding schedule in *Table 3* lays out what is programmed for the feasibility study completion, pending allocation of General Investigation (GI) funds for the USACE.

Federal funds may be transferred to or from the study work allowance in accordance with USACE regulations, but only after approval by the Executive Steering Committee (ESC). The fiscal year shown is the Federal Fiscal Year (FY) commencing on the 1st of each October. USACE will provide a written request to the non-Federal sponsor identifying their cash requirements 60 days prior to the beginning of the FY. The non-Federal Sponsor cash share of the cost of the Feasibility Study will be presented to the USACE 15 days following receipt of the District's work allowance of Federal funds unless otherwise agreed to by the ESC.

Fiscal Year	Total	Federal (USACE) Funds	Non-Federal Sponsor (City of Chicago) Contributions	
			Cash	WIK Credit
2007	$228,100	$114,050	$94,150	$19,900
2008	$776,200	$388,100	$96,150	$291,950
2009	$1,092,250	$546,125	$331,625	$214,500
2010	$451,900	$225,950	$142,050	$83,900
2011	$101,550	$50,775	$19,925	$30,850
Total	$2,650,000	$1,325,000	$683,900	$641,100

Table 3: Funding Schedule of Feasibility Study Expenses

REFERENCES

The following guidance documents and references will be used to conduct the study tasks:

a. Fish and Wildlife Coordination Act of 1958, as amended, Public Law 85-624
b. National Historic Preservation Act of 1966, as amended, Public Law 89-665
c. National Environmental Policy Act of 1969, as amended, Public Law 91-190
d. The Federal Water Pollution Control Act of 1972, as amended, Public Law 92-50
e. Conservation, Protection, and Propagation of Endangered Species Act of 1973, as amended, Public Law 93-205
f. Archaeological and Historic Preservation Act of 1974, Public Law 93-291
g. Water Resources Development Act of 1986, Public Law 99-662
h. Economic and Environmental Principles for Water and Related Land Resources Implementation Studies.
i. Executive Order 11988, 24 May 1977, Flood Plain Management
j. Executive Order 11990, 24 May 1977, Protection of Wet lands
k. ER 5-2-11 USACE Business Process
l. ER 37-2-10 Accounting and Reporting Civil Work Activities.
m. ER 200-2-2 Procedures for Implementing NEPA
n. ER 405-1-12, Real Estate Handbook.
o. ER 1105-2-100 Planning Guidance Notebook
p. ER 1110-2-1150 Engineering and Design for Civil Works Projects
q. ER 1165-2-21 Flood Damage Reduction Measures for Urban Areas
r. ER 1165-2-26 Implementation of Executive Order 119 on Flood Plain Management
s. ER 1165-2-121 Flood Control Cost Sharing Under the Ability to Pay Provision
t. ER 1165-2-132 Hazardous Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects
u. ER 1165-2-501 Civil Works Ecosystem Restoration Policy.
v. EM 1110-2-1301 Cost Estimates - Planning and Design Stages
w. EM 1110-2-1304 Civil Works Construction Cost Index System
x. EM 1110-2-1902, Stability of Earth and Rockfill Dams
y. EM 110-2-1913 Design and Construction of Levees
z. EM 1110-2-1901 Stability of Earth and Rock-Fill Dams
aa. EM 1110 20-1904 Settlement Analysis
bb. EM 1110-1-1905 Bearing Capacity of Soils
cc. EC 1110-2-53 Civil Works Project Cost Estimating - Code.
dd. EC 405-2-14, Real Estate Requirements for Local Cooperative Projects.
ee. Relocation Assistance and Property Acquisition Act of 1970, as amended, Public Law 91-646.

ACRONYMS

A listing of the acronyms used in this PMP is provided below.

A-E	Architect-Engineer
AFB	Alternative Formulation Briefing
ASA-CW	Office of the Assistant Secretary of the Army for Civil Works
CE/ICA	Cost Effectiveness / Incremental Cost Analysis
CEFMS	Corps of Engineers Financial Management System
CELRC	U.S. Army Corps of Engineers Chicago District
CELRD	U.S. Army Corps of Engineers Great Lakes and Ohio River Division
CSO	Combined Sewer Overflow
CWA	Clean Water Act
CWBS	Civil Works Breakdown Structure
CWRB	Civil Works Review Board
DDR	Detailed Design Report
DOE	Department of Environment, City of Chicago
EA	Environmental Assessment
EC	Engineering Circular
EIS	Environmental Impact Statement
EPR	External Peer Review
ER	Engineering Regulation
ERDC	U.S. Army Corps of Engineers Engineer Research & Development Center
ESA	Endangered Species Act
ESC	Executive Steering Committee
FCR	Friends of the Chicago River
FCSA	Feasibility Cost Sharing Agreement
FONSI	Finding of No Significant Impact
FSM	Feasibility Scoping Meeting
FWCA	Fish and Wildlife Coordination Act
FY	Fiscal Year (01Oct – 30Sep)
GI	General Investigations
GIS	Geographic Information Systems
H&H	Hydrology and Hydraulics
HEC	Hydrologic Engineering Center
HEC-RAS	Hydrologic Engineering Center's River Analysis System
HQUSACE	Headquarters, U.S. Army Corps of Engineers
HTRW	Hazardous, Toxic, and Radiological Waste
ICM	Integrated Compartment Model
IEPA	Illinois Environmental Protection Agency
IPR	Internal Progress Review
IRC	Issue Resolution Conference
ITR	Independent Technical Review
ITRT	Independent Technical Review Team

LERRD	Lands, Easements, Rights-of-Way, Relocations and Disposal Area
MCACES	Microcomputer Aided Cost Engineering System (MII)
MWRDGC	Metropolitan Water Reclamation District of Greater Chicago
NEPA	National Environmental Policy Act
NER	National Ecosystem Restoration
NHPA	National Historic Preservation Act
OMB	Office of Management and Budget
PAO	Public Affairs Officer
PCA	Project Cooperation Agreement
PDT	Project Development Team
PED	Preconstruction Engineering and Design
PM	Project Manager
PMP	Project Management Plan
PRB	Project Review Board
PRP	Peer Review Plan
PT	Product Team
QCP	Quality Control Plan
QM	Quality Manager
QMP	Quality Management Plan
RAPS	Racine Avenue Pumping Station
REP	Real Estate Plan
ROD	Record of Decision
SFSB	South Fork South Branch of the Chicago River (Bubbly Creek)
SHPO	State Historic Preservation Officer
SM	Study Manager
SSA	Source Selection Authority
SSEB	Source Selection Evaluation Board
SSP	South Selection Plan
SWMM	Storm Water Management Model
TARP	Tunnel and Reservoir Plan (Deep Tunnel)
TET	Technical Evaluation Team
TMDL	Total Daily Maximum Loading
TNET	Tunnel Network Model
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WRDA	Water Resource Development Act

ATTACHMENT A

SUMMARY OF COSTS BY ACTIVITY

Summary of Feasibility Phase Costs by Sub-Account

SUB-ACCOUNT	DESCRIPTION	TOTAL COST	Federal			Non-Federal		
			IN HOUSE	CONTRACT	TOTAL	IN HOUSE	CONTRACT	TOTAL
22A	Public Involvement	$59,150	$11,600	$0	$11,600	$17,550	$30,000	$47,550
22B	Institutional Studies	$24,700	$20,800	$0	$20,800	$3,900	$0	$3,900
22C	Social Studies	$32,800	$2,900	$0	$2,900	$3,900	$26,000	$29,900
22D	Cultural Resources Studies	$63,300	$3,400	$0	$3,400	$3,900	$56,000	$59,900
22E	Environmental Studies	$262,350	$177,000	$47,000	$224,000	$5,850	$32,500	$38,350
22F	Fish and Wildlife Studies	$24,000	$9,000	$15,000	$24,000	$0	$0	$0
22G	Economic Studies	$35,200	$35,200	$0	$35,200	$0	$0	$0
22H	Real Estate Analysis	$102,350	$43,800	$0	$43,800	$11,050	$47,500	$58,550
22J	Hydrology/Hydraulics Studies	$432,600	$112,200	$310,000	$422,200	$10,400	$0	$10,400
22K	Geotechnical Studies	$368,650	$104,600	$232,000	$336,600	$4,550	$27,500	$32,050
22L	HTRW Assessments	$254,500	$50,400	$75,000	$125,400	$9,100	$120,000	$129,100
22N	Surveys and Mapping	$135,700	$11,200	$0	$11,200	$6,500	$118,000	$124,500
22P	Design/Project Cost Estimates	$81,000	$81,000	$0	$81,000	$0	$0	$0
22Q	Planning Technical Management	$86,750	$77,000	$0	$77,000	$9,750	$0	$9,750
22R	Plan Formulation and Evaluation	$293,950	$258,200	$0	$258,200	$35,750	$0	$35,750
22S	Feasibility Report Preparation	$166,550	$116,800	$40,000	$156,800	$9,750	$0	$9,750
22T	Programs and Project Management	$71,400	$58,400	$0	$58,400	$13,000	$0	$13,000
22V	Initial Draft PCA and PED Agreement	$48,050	$34,400	$0	$34,400	$13,650	$0	$13,650
22Y	*Washington Level Review*	*$50,000*	*$25,000*	*$0*	*$25,000*	*$25,000*	*$0*	*$25,000*
22Z	Peer Review Plan	$57,000	$57,000	$0	$57,000	$0	$0	$0
BASE:		$2,650,000	$1,289,900	$719,000	$2,008,900	$183,600	$457,500	$641,100

Summary of Fed/Non-Fed Funding

STUDY PARTNER	CASH	WIK CREDIT	TOTAL FUNDING
USACE	$1,325,000	N/A	$1,325,000
City of Chicago	$683,900	$641,100	$1,325,000

Sub-Account 22A - Public Involvement

Federal Costs	Rate ($/day)	Public Meetings		Coordination		Project Website		Total Cost	
		days	$	days	$	days	$	days	$
Chicago District Labor:									
Planning, Programs, Project Mgmt Div.	$1,200	1	$1,200	0	$0	0	$0	1	$1,200
Planning Branch	$1,000	2	$2,000	0	$0	0	$0	2	$2,000
Economic & Plan Formulation Section	$800	4	$3,200	0	$0	0	$0	4	$3,200
Environmental & Social Analysis Section	$800	4	$3,200	0	$0	0	$0	4	$3,200
Programs & Project Management Branch	$1,000	2	$2,000	0	$0	0	$0	2	$2,000
Total Federal Costs:		13	$11,600	0	$0	0	$0	13	$11,600

Non-Federal Costs	Rate ($/day)	Public Meetings		Coordination		Project Website		Total Cost	
		days	$	days	$	days	$	days	$
City of Chicago Labor:									
Department of Planning	$650	4	$2,600	4	$2,600	10	$6,500	18	$11,700
Department of Environment	$650	4	$2,600	0	$0	1	$650	5	$3,250
Mayor's Office	$650	4	$2,600	0	$0	0	$0	4	$2,600
Miscellaneous Costs:									
Contractual Project Website							$30,000		$30,000
Total Non-Federal Costs:		12	$7,800	4	$2,600	11	$37,150	27	$47,550

TASK SUB-ACCOUNT 22A **TOTAL: 40 $59,150**

Major Task	Description and Assumptions
Public Meetings	Assume project will require two public meetings. Estimate includes issuing public notice, coordinating meetings, attendance, presentation materials, minutes, and follow-up on comments received.
Coordination	Estimate includes initial coordination and ongoing coordination with interested parties within the study area.
Project Website	Estimate includes development of a project website, updating of its content throughout the study process, and management of contract.

Sub-Account 22B - Institutional Studies/Report

Federal Costs	Rate ($/day)	Legal/Inst. Analysis		Ability to Pay Analysis		Financing Plan		Total Cost	
		days	$	days	$	days	$	days	$
Chicago District Labor:									
Planning, Programs, Project Mgmt Div.	$1,200	0.5	$600	0.5	$600	0.5	$600	1.5	$1,800
Planning Branch	$1,000	1	$1,000	1	$1,000	1	$1,000	3	$3,000
Economic & Plan Formulation Section	$800	5	$4,000	10	$8,000	5	$4,000	20	$16,000
Total Federal Costs:		6.5	$5,600	11.5	$9,600	6.5	$5,600	24.5	$20,800

Non-Federal Costs	Rate ($/day)	Legal/Inst. Analysis		Ability to Pay Analysis		Financing Plan		Total Cost	
		days	$	days	$	days	$	days	$
City of Chicago Labor:									
Department of Environment	$650	1	$650	0	$0	0	$0	1	$650
Department of Legal	$650	5	$3,250	0	$0	0	$0	5	$3,250
Total Non-Federal Costs:		6	$3,900	0	$0	0	$0	6	$3,900

TASK SUB-ACCOUNT 22B **TOTAL: 30.5 $24,700**

Major Task	Description and Assumptions
Legal /Institutional Analysis	Identify the jurisdictions, concerns and authorities of the Non-Federal sponsor(s), and to determine the level of interest of agencies and organizations that may be involved in the study. The legal and institutional requirements for implementation of project features will also be identified.
Ability to Pay Analysis	The ability to pay analysis will include an assessment of the sponsor's financial capability, a statement of financial capability/ability to pay, and a financing plan
Financing Plan for Project Implementation	The financing plan for project implementation, includes Government outlays, non-Federal sponsor cash and credit contributions, use of lands and disposal areas requirements by Fiscal Year. Assumed that multiple local government agencies (MWRDGC, City of Chicago Park District, etc.) will be operating and maintaining the project features.

Sub-Account 22C - Social Resources Studies

Federal Costs	Rate ($/day)	Social Res. Analysis		Assess Impacts		NEPA Documentation		Total Cost	
		days	$	days	$	days	$	days	$
Chicago District Labor:									
Planning, Programs, Project Mgmt Div.	$1,200	0	$0	0	$0	0	$0	0	$0
Planning Branch	$1,000	0	$0	0	$0	0.5	$500	0.5	$500
Environmental & Social Analysis Section	$800	1	$800	1	$800	1	$800	3	$2,400
Total Federal Costs:		1	$800	1	$800	1.5	$1,300	3.5	$2,900

Non-Federal Costs	Rate ($/day)	Social Res. Analysis		Assess Impacts		NEPA Documentation		Total Cost	
		days	$	days	$	days	$	days	$
City of Chicago Labor:									
Department of Planning	$650	1	$650	1	$650	3	$1,950	5	$3,250
Department of Environment	$650	0	$0	0	$0	1	$650	1	$650
Miscellaneous Costs:									
Contractual Services			$6,000		$10,000		$10,000	0	$26,000
Total Non-Federal Costs:		1	$6,650	1	$10,650	4	$12,600	6	$29,900

TASK SUB-ACCOUNT 22C **TOTAL: 9.5 $32,800**

Major Task	Description and Assumptions
Social Resources Analysis	Utilizing GIS and census data, establish a baseline and future without project conditions human resource profile of the study area.
Assess Social Resources Impacts	Assess impacts of alternatives to human resources.
NEPA Documentation	Document social resources according to NEPA regulations.

Sub-Account 22D - Cultural Resources Studies

Federal Costs	Rate ($/day)	Cult. Res. Analysis		Archeological Survey		Assess Impacts		Section 106 Consultation		NEPA Documentation		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
Chicago District Labor:													
Planning, Programs, Project Mgmt Div.	$1,200	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Planning Branch	$1,000	0	$0	0	$0	0	$0	0.5	$500	0.5	$500	1	$1,000
Environmental & Social Analysis Section	$800	0	$0	0	$0	0	$0	2	$1,600	1	$800	3	$2,400
Total Federal Costs:		0	$0	0	$0	0	$0	2.5	$2,100	1.5	$1,300	4	$3,400

Non-Federal Costs	Rate ($/day)	Cult. Res. Analysis		Archeological Survey		Assess Impacts		Section 106 Consultation		NEPA Documentation		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:													
Department of Planning	$650	0	$0	1	$650	0	$0	2	$1,300	2	$1,300	5	$3,250
Department of Environment	$650	0	$0	0	$0	0	$0	0	$0	1	$650	1	$650
Miscellaneous Costs:													
Contractual Services			$6,000		$25,000		$8,000		$6,000		$11,000		$56,000
Total Non-Federal Costs:		0	$6,000	1	$25,650	0	$8,000	2	$7,300	3	$12,950	6	$59,900

TASK SUB-ACCOUNT 22D **TOTAL: 10 $63,300**

Major Task	Description and Assumptions
Cultural Resources Analysis	Identify cultural resources in study area by gathering historical information and utilizing GIS. Assume much historical documentation already exists.
Archeological Survey	It is assumed that limited field surveys will be conducted to include surface collection, plowing, and shovel-testing by a qualified archaeologist.
Assess Cultural Resources Impacts	Assess impacts of alternatives to cultural resources and provide recommendations for plan alterations.
Section 106 Consultation	Coordinate and provide comprehensive documentation of results to the State Historic Preservation Office for Section 106 consultation and review. Assume that consultation with the I&M Canal Corridor Association will also be required.
NEPA Documentation	Document cultural resources according to NEPA regulations.

Sub-Account 22E - Environmental Resources Study

Federal Costs	Rate ($/day)	Inventory Env. Resources		Establish Goals & Obj.		Develop Hab. Assess. Tool		NEPA Documentation		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
Chicago District Labor:													
Planning, Programs, Project Mgmt Div.	$1,200	1	$1,200	0.5	$600	2	$2,400	1	$1,200	1	$600	5	$6,000
Planning Branch	$1,000	10	$10,000	2	$2,000	5	$5,000	3	$3,000	3	$3,000	23	$23,000
Environmental & Social Analysis Section	$800	15	$12,000	10	$8,000	40	$32,000	25	$20,000	5	$4,000	95	$76,000
Programs & Project Management Branch	$1,000	2	$2,000	2	$2,000	5	$5,000	4	$4,000	5	$5,000	18	$18,000
Technical Services Div.	$1,200	0.5	$600	0	$0	0	$0	0.5	$600	1	$1,200	2	$2,400
Design Branch	$1,200	1	$1,200	0	$0	0	$0	1	$1,200	1	$1,200	3	$3,600
Chief, Hydraulic & Env. Engineering	$1,000	2	$2,000	0	$0	0	$0	4	$4,000	2	$2,000	8	$8,000
Hydraulic & Env. Engineering Section (HE)	$800	15	$12,000	0	$0	0	$0	25	$20,000	10	$8,000	50	$40,000
Miscellaneous Costs:													
Equipment Use for Biological Field Sampling			$2,000										$2,000
Contractual Water Quality Survey			$20,000										$20,000
Contractual Sediment Flux Survey			$25,000										$25,000
Total Federal Costs:		46.5	$88,000	14.5	$12,600	52	$44,400	63.5	$54,000	28	$25,000	204	$224,000

Non-Federal Costs	Rate ($/day)	Inventory Env. Resources		Establish Goals & Obj.		Develop Hab. Assess. Tool		NEPA Documentation		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:													
Department of Environment	$650	2	$1,300	2	$1,300	0	$0	0	$0	5	$3,250	9	$5,850
Miscellaneous Costs:													
Contractual Services			$25,000		$7,500								$32,500
Total Non-Federal Costs:		2	$26,300	2	$8,800	0	$0	0	$0	5	$3,250	9	$38,350

TASK SUB-ACCOUNT 22E **TOTAL:** **213** **$262,350**

Major Task	Description and Assumptions
Inventory of Environmental Resources	Develop a GIS-based inventory of natural resources within the study area. Collect, review, and incorporate previous data and reports. Identify data gaps and scope for field collection. Assume a biological field collection contract is required. Develop inventory report. Assume ground water, surface water collection, and sediment contamination flux sampling contracts are required.
Establish Restoration Goals and Objectives / Opportunities and Constraints	Further define environmental resource problems and opportunities. Refine restoration goals and objectives.
Develop Habitat Assessment Tool	Develop a habitat assessment tool based on specific habitats or indicator species for use in establishing existing condition ecological functions and quantifying increases in ecological outputs associated with plans and plan scales.
NEPA Documentation	NEPA document will be prepared and coordinated with State and Federal environmental agencies and the public. The NEPA document will also include the Section 404 evaluation and Finding of No Significant Impacts (FONSI) or Record of Decision (ROD). Assume an Environmental Assessment will be the required NEPA document.

Sub-Account 22F - Fish & Wildlife Coordination Act Report

Federal Costs	Rate ($/day)	Coordinate w/ USFWS		Coordination Act Report		Total Cost	
		days	$	days	$	days	$
Chicago District Labor:							
Planning, Programs, Project Mgmt Div.	$1,200	0	$0	0	$0	0	$0
Planning Branch	$1,000	1	$1,000	0	$0	1	$1,000
Environmental & Social Analysis Section	$800	10	$8,000	0	$0	10	$8,000
Miscellaneous Costs:							
USFWS Coordination Act Reimbursement					$15,000		$15,000
Total Federal Costs:		11	$9,000	0	$15,000	11	$24,000

Non-Federal Costs	Rate ($/day)	Coordinate w/ USFWS		Coordination Act Report		Total Cost	
		days	$	days	$	days	$
City of Chicago Labor:							
Department of Planning	$650	0	$0	0	$0	0	$0
Department of Environment	$650	0	$0	0	$0	0	$0
Total Non-Federal Costs:		0	$0	0	$0	0	$0

TASK SUB-ACCOUNT 22F **TOTAL: 11 $24,000**

Major Task	Description and Assumptions
Coordination with USFWS	Coordinate with the USFWS in providing and reviewing information necessary to assist the USFWS in rendering a draft and final opinion under the Coordination Act.
USFWS Coordination Act Report	As required by law, an inter-agency transfer of funds will be provided to the USFWS to compensate for their involvement and preparation of the Coordination Act Report.

Sub-Account 22G - Economic Analyses

Federal Costs	Rate ($/day)	Determine Benefits		CE/ICA Analysis		Total Cost	
		days	$	days	$	days	$
Chicago District Labor:							
Planning, Programs, Project Mgmt Div.	$1,200	0.5	$600	0.5	$600	1	$1,200
Planning Branch	$1,000	1	$1,000	1	$1,000	2	$2,000
Economic & Plan Formulation Section	$800	10	$8,000	5	$4,000	15	$12,000
Environmental & Social Analysis Section	$800	5	$4,000	20	$16,000	25	$20,000
Total Federal Costs:		16.5	$13,600	26.5	$21,600	43	$35,200

Non-Federal Costs	Rate ($/day)	Determine Benefits		CE/ICA Analysis		Total Cost	
		days	$	days	$	days	$
City of Chicago Labor:							
Department of Planning	$650	0	$0	0	$0	0	$0
Department of Environment	$650	0	$0	0	$0	0	$0
Total Non-Federal Costs:		0	$0	0	$0	0	$0

TASK SUB-ACCOUNT 22G **TOTAL: 43 $35,200**

Major Task	Description and Assumptions
Determine Socio-Economic Benefits	Determine socio-economic benefits of ecosystem restoration and recreation components.
Perform CE/ICA Analysis	Evaluate restoration benefits in terms of cost effectiveness and incremental cost analysis (CE/ICA) techniques using IWR-PLAN Decision Support Software.

Sub-Account 22H - Real Estate Analysis & Documents

Federal Costs	Rate ($/day)	Coordination		Determine LERRDs		Pre. Opinion of Compens.		Obtain Rights of Entry		Gross Appraisal		Real Estate Plan		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$	days	$
Detroit District Labor:															
Real Estate Div.	$1,200	0	$0	1	$1,200	1	$1,200	1	$1,200	1	$1,200	1	$1,200	5	$6,000
Acquisition Branch	$1,050	2	$2,100	5	$5,250	2	$2,100	5	$5,250	0	$0	10	$10,500	24	$25,200
Appraisal Branch	$900	2	$1,800	0	$0	0	$0	0	$0	12	$10,800	0	$0	14	$12,600
Total Federal Costs:		4	$3,900	6	$6,450	3	$3,300	6	$6,450	13	$12,000	11	$11,700	43	$43,800

Non-Federal Costs	Rate ($/day)	Coordination		Determine LERRDs		Pre. Opinion of Compens.		Obtain Rights of Entry		Gross Appraisal		Real Estate Plan		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:															
Department of Planning	$650	2	$1,300	0	$0	0	$0	0	$0	0	$0	0	$0	2	$1,300
Department of Environment	$650	2	$1,300	0	$0	0	$0	5	$3,250	0	$0	0	$0	7	$4,550
Department of Legal	$650	1	$650	1	$650	0	$0	2	$1,300	2	$1,300	2	$1,300	8	$5,200
Miscellaneous Costs:															
Contractual Services			$5,000		$5,000		$25,000		$2,500				$6,000		$43,500
Contractual Title Search													$4,000		$4,000
Total Non-Federal Costs:		5	$8,250	1	$5,650	0	$25,000	7	$7,050	2	$1,300	2	$11,300	17	$58,550

TASK SUB-ACCOUNT 22H **TOTAL: 60 $102,350**

Major Task	Description and Assumptions
Coordination with Non-Federal Sponsor	Meet with the Non-Federal Sponsor, explain Real Estate obligations; ensure that the Non-Federal Sponsor concurs in the Schedule of Real Estate Activities; discuss and obtain capability assessment from the Non-Federal Sponsor; identify utility landowners and make sure the Non-Federal Sponsor concurs in any utility relocations.
Determine LERRDs	Obtain a credit appraisal by a qualified appraiser; determine valuation based on the executed PCA; follow the guidelines set forth in Chapter 12 of ER 405-1-12.
Preliminary Opinion of Compensability	The attorney prepares an opinion that sets forth the scope of the investigation and sources used to reach the findings and conclusions; finds that the facility/utility serves a public use; discusses the necessity for continued service of the facility/utility; contains a certification as to ownership of the facility/utility; determines that the facility/utility owner has or does not have a compensable interest in real estate and contains discussion of the conclusions; sets forth an opinion of the Government's / sponsor's legal obligation to relocate eligible facilities; states the requirements/authority of the facility/utility owner to sign a relocation contract; includes exhibits indicating the location of the facility/utility and indicate land occupied by the facility in which the owner has compensable/non-compensable interests.
Obtain Rights-of-Entry	Identify the purpose, need and scope of investigations; review mapping; identify the landowners; prepare Rights of Entry, making sure that they conform to regulations.
Perform Gross Appraisal	Follow current professional appraisal practices, giving consideration to three approaches to value, i.e., the Cost, Income Capitalization, and Sales Comparison Approaches, unless otherwise specified in the scope of work. Apply the Uniform Appraisal Standards for Federal Land Acquisitions and Uniform Standards of Professional Appraisal Practices. If certain approaches or requirements are not applicable to the assignment, identify and explain the omission. Specify if the report has a departure provision, making it a limited scope appraisal or a summary appraisal report.
Prepare Real Estate Plan (REP)	Prepare a document that addresses all topics required in regulations; coordinate environmental issues with technical elements; accurately state real estate requirements and issues; prepare realistic budget and cost information; ensure that all items on the QCP Checklists are complete; detail realistic and coordinated acquisition schedule milestones; and describe jurisdiction of Non-Federal Sponsor.

Sub-Account 22J - Hydrologic and Hydraulic Studies

Federal Costs	Rate ($/day)	Review Dynamics of CSOs		Review Current Modeling		Modify Models		Develop SWMM Model		Modify TNET Model		Calibrate Models		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$	days	$
Chicago District Labor:															
Technical Services Div.	$1,200	0	$0	0	$0	0	$0	0.5	$600	0	$0	0.5	$600	1	$1,200
Design Branch	$1,000	0.5	$500	0.5	$500	0.5	$500	2	$2,000	0.5	$500	1	$1,000	5	$5,000
Hydraulic & Env. Engineering Section (HH)	$800	2	$1,600	2	$1,600	3	$2,400	25	$20,000	5	$4,000	10	$8,000	47	$37,600
Miscellaneous Costs:															
Contractual H&H Analyses			$2,000		$2,000		$3,000		$120,000		$10,000		$18,000		$155,000
Total Federal Costs:		2.5	$4,100	2.5	$4,100	3.5	$5,900	27.5	$142,600	5.5	$14,500	11.5	$27,600	53	$198,800

Non-Federal Costs	Rate ($/day)	Review Dynamics of CSOs		Review Current Modeling		Modify Models		Develop SWMM Model		Modify TNET Model		Calibrate Models		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:															
Department of Environment	$650	1	$650	1	$650	0	$0	2	$1,300	0	$0	0	$0	4	$2,600
Department of Water Management	$650	2	$1,300	2	$1,300	0	$0	0	$0	0	$0	0	$0	4	$2,600
Total Non-Federal Costs:		3	$1,950	3	$1,950	0	$0	2	$1,300	0	$0	0	$0	8	$5,200

TASK SUB-ACCOUNT 22J **TOTAL: 61 $204,000**

Major Task	Description and Assumptions
Review Existing Dynamics of CSOs	The existing dynamics of the CSOs will be reviewed and collect any missing data. Data includes dynamics of the system, recorded hydrologic data of wetwell/sump inflows, gravity overflows from interceptors to drop shafts, RAPS pumping to Bubbly Creek (frequency and volume), pumping and/or gravity flows to interceptors and TARP tunnels, and direct CSO discharges to Bubbly Creek along the channel north of RAPS.
Review Current Modeling	Review the current modeling and check for accuracy. Verify connectivity of contributing areas to dropshafts within TNET model. Verify percentage of flow routed to multiple dropshafts from a single contributing area.
Modify models	Modify TNET model as necessary based on extensive model review in preceding task.
Develop SWMM Model	Develop SWMM hydraulic sewer model for sewershed areas tributary to RAPS and the dropshafts and outfalls north of RAPS. Add water quality capability to the model including temperature, dissolved oxygen, biological oxygen demand, total suspended solids, and other parameters as needed. The operation of RAPS will be included in the newly developed SWMM model, which will include the addition of modeling the wetwell/sump inflows from their respective contributing areas and adding pumping capability of RAPS. Include decision making routines that mimic operation at RAPS regarding when the pumps operate and where flows are discharged.
Modify TNET Model	Modify existing TNET model to operate under existing conditions without reservoir on-line. Include closure sequencing of dropshaft gates based on index dropshaft stages and based on MWRDGC operation plan. For future with reservoir on-line conditions, add capability of dropshafts to remain closed until tunnels pressurize.
Calibrate Models	Run models for one to three year test periods and compare simulated to recorded values at RAPS. Primary focus will be in the comparison of CSO discharges to Bubbly Creek from RAPS and the outfalls north of RAPS. Adjust index dropshaft and closure sequencing to get a reasonable correlation of simulated to recorded (pumping records) inflows to TARP.

Sub-Account 22J - Hydrologic and Hydraulic Studies (continued)

Federal Costs	Rate ($/day)	Run Period of Record Model		Develop CH3D Hyd. Model		Develop GTRAN Sed. Stability Model		Develop CEQUAL-ICM WQ Model		Alternative Analysis		Develop Hydraulic Eng. Appendix		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$	days	$
Chicago District Labor:															
Technical Services Div.	$1,200	0	$0	0	$0	0	$0	0	$0	1	$1,200	1	$1,200	2	$2,400
Design Branch	$1,000	0.5	$500	0.5	$500	0.5	$500	0.5	$500	2	$2,000	2	$2,000	6	$6,000
Hydraulic & Env. Engineering Section	$800	15	$12,000	5	$4,000	5	$4,000	5	$4,000	25	$20,000	20	$16,000	75	$60,000
Miscellaneous Costs:															
Contractual H&H Analyses			$5,000												$5,000
Other Corps (ERDC-WES)					$25,000		$25,000		$75,000		$25,000				$150,000
Total Federal Costs:		15.5	$17,500	5.5	$29,500	5.5	$29,500	5.5	$79,500	28	$48,200	23	$19,200	83	$223,400

Non-Federal Costs	Rate ($/day)	Run Period of Record Model		Develop CH3D Hyd. Model		Develop GTRAN Sed. Stability Model		Develop CEQUAL-ICM WQ Model		Alternative Analysis		Develop Hydraulic Eng. Appendix		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:															
Department of Environment	$650	1	$650	1	$650	0	$0	2	$1,300	0	$0	0	$0	4	$2,600
Department of Water Management	$650	2	$1,300	2	$1,300	0	$0	0	$0	0	$0	0	$0	4	$2,600
Total Non-Federal Costs:		3	$1,950	3	$1,950	0	$0	2	$1,300	0	$0	0	$0	8	$5,200

TASK SUB-ACCOUNT 22J **91** **$228,600**

Major Task	Description and Assumptions
Run Model for 52-year Period of Record	Develop a future condition model for the full 52-year period of record. Incorporate the interceptor modifications east of RAPS as currently designed by MWRDGC. Run future condition model with McCook reservoir on-line for two dropshaft configurations: an open dropshaft condition and a closed dropshaft condition (until TARP tunnel pressurization occurs).
Develop CH3D Hydraulic Model	A CH3D hydraulic model of Bubbly Creek is required to generate the velocities, stages, residence, and mixing predictions needed to evaluate sediment capping measures for erosion control. The CH3D model will also provide hydrodynamic input for the CE-QUAL-ICM water quality model. Tasks associated with the development of the hydraulic model include gathering existing bathymetric data, pumping data, and water surface elevation gage data. Velocity and water elevation data will be collected at three locations along Bubbly Creek for model calibration and validation. Data should be collected during two pumping events of differing magnitude and provide a time history of velocity and water elevation for a 12-24 hour period. It is assumed that MWRD would collect necessary field data. Input files would be developed, initial calibration for maximum pump rate scenario performed, and velocity data for sediment cap design provided. A report would be prepared documenting the baseline hydraulic modeling.
Develop GTRAN Sediment Stability Model	The GTRAN model, linked with the CH3D hydrodynamic model output for Bubbly Creek, is required to determine sediment capping stability under various hydrodynamic scenarios. The GTRAN model is specifically designed to quantify sediment stability and transport rate at each cell in the hydrodynamic grid. This data will then be interpolated to estimate stable cap grain size (or grain size distribution) variation over the Bubbly Creek sediment bed. This effort does not assess cap stability relative to the underlying sediments; geotechnical evaluations are needed to assess cap stability relative to the underlying sediments, address slope stability, bearing capacity, settlement and filtering requirements as outlined in Sub-Account 22K Geotechnical Studies.

Sub-Account 22J - Hydrologic and Hydraulic Studies (continued)

Major Task	Description and Assumptions
Develop CEQUAL-ICM Water Quality Model	A calibrated Integrated Compartment Model (ICM) Water Quality Model is required to evaluate cap requirements to control contaminant and nutrient fluxes from the sediment to provide suitable conditions for long-term water quality given control of surface discharges and channel residence times. This study requires sediment flux estimates, predictions of the effects of gas generation, and water quality data for calibration. In-situ measurements of water quality parameters (dissolved oxygen, nutrients (N&P), algae (chlorophyll and algae groups), organic load (BOD, CBOD), boundary loads with and without pumping loads are needed for calibration. Laboratory and field tests of fluxes would be performed to estimate the effects of various processes such as diffusion, groundwater, and gas generation; computer model, as well, would be ran to generate the flux estimates and evaluate processes. It is assumed that representative pumping data and discharge water quality is available. Water quality simulations would be run for representative baseline conditions. A report would be prepared documenting the baseline water quality modeling.
Run Alterative Models	Project alternatives to be modeled include; reducing extremely high flow velocities during CSO events; reducing impacts from CSOs on water and sediment quality; reducing contaminant migration from exisiting sediments (assume four capping alternatives); improving water quality for aquatic habitat; increasing or improving riverine and riparian habitats; restoring native plant communities within river corridor; and restoring wetlands within river corridor. Run models with the project alternatives for the existing and two future project conditions. Determine bed shear stresses and erosive forces for the existing and two future project condition models for the without project condition and with project condition models. Compare model results with respect to frequency, flows and volumes of CSOs to Bubbly Creek as well as bed shear stresses. Based on model results, determine if additional means or alternatives are needed to further reduce the frequency and volume of CSOs discharged directly to Bubbly Creek from dropshafts north of RAPS.
Develop Hydraulic Engineering Appendix	A report containing a description and results of the modeling will be prepared for inclusion in the Hydrology and Hydraulics Engineering Appendix to the Feasibility Report. The report will contain information on the design, analysis, computer simulations, and alternative design comparison of results.

Sub-Account 22K - Geotechnical Studies

Federal Costs	Rate ($/day)	Prelim. Alt. Evaluation		Field Investigation		Add. Field Investigation		Slope Stab./ Consolidation Analysis		Geotechnical Appendix		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
Chicago District Labor:													
Technical Services Div.	$1,200	0.5	$600	0.5	$600	0.5	$600	0.5	$600	1	$1,200	3	$3,600
Design Branch	$1,000	1	$1,000	1	$1,000	1	$1,000	1	$1,000	2	$2,000	6	$6,000
Geotechnical Engineering Section	$1,000	15	$15,000	10	$10,000	10	$10,000	10	$10,000	50	$50,000	95	$95,000
Miscellaneous Costs:													
Contractual Subsurface Inv. & Soils Labs					$130,000		$42,000						$172,000
Other Corps (ERDC-WES)									$60,000				$60,000
Total Federal Costs:		16.5	$16,600	11.5	$141,600	11.5	$53,600	11.5	$71,600	53	$53,200	104	$336,600

Non-Federal Costs	Rate ($/day)	Prelim. Alt. Evaluation		Field Investigation		Add. Field Investigation		Slope Stab./ Consolidation Analysis		Geotechnical Appendix		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:													
Department of Environment	$650	2	$1,300	3	$1,950	2	$1,300	0	$0	0	$0	7	$4,550
Miscellaneous Costs:													
Contractual Services					$20,000		$7,500						$27,500
Total Non-Federal Costs:		2	$1,300	3	$21,950	2	$8,800	0	$0	0	$0	7	$32,050

TASK SUB-ACCOUNT 22K **111 $368,650**

Major Task	Description and Assumptions
Preliminary Alternative Evaluation	Evaluate Alternatives using secondary data sources (available existing subsurface data from local, state and federal sources), to provide sufficient information for comparison of the alternatives. This information will be added to the Project GIS database for analysis.
Field Investigation	Laboratory tests are needed to determine the engineering properties of the organic sediments; specific interest in determination of the undrained shear strength and deformation characteristics of the deposits. Sampling should recover undisturbed samples from 5-inch diameter Shelby tubes at six critical locations along Bubbly Creek. At each location, two undisturbed samples should be retrieved from depths of about one third and two-thirds of the total thickness of the deposit at that location. Unconsolidated undrained (UU or Q-tests) should be performed to assess the undrained shear strength where the samples were retrieved. The wet unit weight and water content of each sample will also be determined. After testing, the gradation (inc. hydrometer), specific gravity and Atterberg limits should be determined. Additionally, fixed-ring dredged material type consolidation tests should be performed on the undisturbed sample obtained from the same locations to help evaluate the settlement and consolidation rate of the organic deposits. Estimated as 1 boring per 500-feet of project length, or 15 total borings.
Additional Field Investigation	Additional field tests are recommended to improve the interpretation of the stratigraphy and strength characteristics of the organic deposits. These tests would include field vane shear testing and cone penetrometer testing. The field vane tests should be performed in boreholes and disturbed sample should be recovered so that Atterberg Limits at the field vane locations can be adjusted for the plasticity index. These tests would serve to improve the evaluation of the variation of the subsurface conditions at the site and would result in improved confidence in the cross-sections and material properties used in the analysis.

Sub-Account 22K - Geotechnical Studies (continued)

Major Task	Description and Assumptions
Slope Stability / Consolidation Analysis	A slope stability analysis will be performed on six critical cross-sections along the creek. The analysis will include the layout and development of each cross-section based on data from all available soil borings, laboratory tests, and field data including hydrographic data. The stability for each section will be evaluated based on three different cap designs. A one-dimensional consolidation analysis should be performed on each of the critical sections used in the stability analysis for three cap designs to determine rate of settlements and the potential for extremes in differential settlement that has the potential to disrupt proper functioning of the sand cap layer. The same cross-sections used in the stability analysis will be studied in the consolidation analysis.
Geotechnical Appendix	A report containing the results of the geotechnical investigations regarding sediment properties and depths, subsurface soil stratigraphy, and physical and engineering properties will be prepared. The Geotechnical Engineering portion of the Engineering Appendix will include: Regional and Local Geology and Groundwater Conditions, Geotechnical Considerations of the Alternatives, Geotechnical Analyses of the Recommended Plan (including: bearing, stability, settlement, seepage), foundation design, material utilization, dewatering and diversion, construction sequencing considerations, and recommendations for additional requirements during development of Plans & Specifications.

Sub-Account 22L - Hazardous Toxic Radioactive Waste (HTRW) Studies

Federal Costs	Rate ($/day)	Phase I HTRW Investigation		Phase II Sediment Investigation		Phase II Soil Investigation		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$	days	$
Chicago District Labor:											
Technical Services Div.	$1,200	0	$0	0.5	$600	0	$0	0.5	$600	1	$1,200
Design Branch	$1,200	0	$0	2	$2,400	0	$0	1	$1,200	3	$3,600
Chief, Hydraulic & Env. Engineering	$1,000	0.5	$500	4	$4,000	0.5	$500	3	$3,000	8	$8,000
Hydraulic & Env. Engineering Section	$800	2	$1,600	35	$28,000	2	$1,600	8	$6,400	47	$37,600
Miscellaneous Costs:											
Contractual Sediment Investigation					$75,000						$75,000
Total Federal Costs:		2.5	$2,100	41.5	$110,000	2.5	$2,100	12.5	$11,200	59	$125,400

Non-Federal Costs	Rate ($/day)	Phase I HTRW Investigation		Phase II Sediment Investigation		Phase II Soil Investigation		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:											
Department of Environment	$650	2	$1,300	5	$3,250	5	$3,250	2	$1,300	14	$9,100
Miscellaneous Costs:											
Contractual Services			$50,000								$50,000
Contractual Soil Investigation							$70,000				$70,000
Total Non-Federal Costs:		2	$51,300	5	$3,250	5	$73,250	2	$1,300	14	$129,100

TASK SUB-ACCOUNT 22L **73 $254,500**

Major Task	Description and Assumptions
Phase I HTRW Investigation	A Phase I HTRW report will be prepared that identifies recognized environmental conditions within and nearby the project study area that indicate a potential for upland HTRW contamination. An evaluation of potential for impacts of these sites to the project will be conducted. The report will include findings from a site reconnaissance; review of facility and regulatory agency records and databases; review of available mapping and aerial photography; and interviews with landowners, knowledgeable individuals, and regulatory agencies. A similar process will be used to evaluate (one) potential disposal site, if required. The location of all known, reported, or suspected HTRW sites will be documented in the Phase I HTRW report.
Phase II Sediment Investigation	Additional sediment investigations will be completed to supplement previous investigations; additional sediment investigations will be tailored support development and impact analysis of particular ecosystem restoration measures that are related to capping sediment, or sediment removal, and handling, and disposal.
Phase II Soil Investigation	A limited upland Phase II HTRW investigation will be performed in upland project areas where the Phase I investigation indicates a potential for HTRW. A Phase II investigation will confirm or deny the presence of HTRW in upland project areas where no previous sampling has been conducted. The results of the investigation will be documented in a Phase II HTRW report.
Management / Coordination	Management and coordination will include such activities as participation in team meetings and upward reporting. Additional coordination with USEPA and IEPA will be completed to determine what portion, if any, of the water quality impairments in the South Fork of the South Branch of the Chicago River are local responsibilities in accordance with the Clean Water Act standards. Coordination regarding sediment quality will be completed with USEPA and IEPA to determine whether remediation falls under other federal jurisdiction that would impact the study.

Sub-Account 22N - Surveying & Mapping

Federal Costs	Rate ($/day)	Develop GIS Database		Utility Mapping		Real Estate Mapping		3D Display Model		Place Design Features		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
Chicago District Labor:													
Planning, Programs, Project Mgmt Div.	$1,200	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Planning Branch (GIS)	$1,000	1	$1,000	0	$0	0	$0	0	$0	0	$0	1	$1,000
Technical Services Div.	$1,200	0	$0	0	$0	0	$0	0	$0	0.5	$600	0.5	$600
Design Branch	$1,200	0	$0	0	$0	0	$0	0	$0	0.5	$600	0.5	$600
Chief, Civil Design Section	$1,000	0	$0	0.5	$500	0.5	$500	0	$0	1	$1,000	2	$2,000
Civil Design Engineer	$800	0	$0	1.5	$1,200	1.5	$1,200	0	$0	2	$1,600	5	$4,000
CADD Technician	$600	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Geotechnical Engineering Section	$1,000	1	$1,000	0	$0	0	$0	2	$2,000	0	$0	3	$3,000
Total Federal Costs:		2	$2,000	2	$1,700	2	$1,700	2	$2,000	4	$3,800	12	$11,200

Non-Federal Costs	Rate ($/day)	Develop GIS Database		Utility Mapping		Real Estate Mapping		3D Display Model		Place Design Features		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:													
Department of Environment	$650	2	$1,300	2	$1,300	2	$1,300	2	$1,300	2	$1,300	10	$6,500
Miscellaneous Costs:													
Contractual Services			$33,000				$7,000				$18,000		$58,000
Contractual Survey					$50,000								$50,000
Contractual 3D Display Model									$10,000				$10,000
Total Non-Federal Costs:		2	$34,300	2	$51,300	2	$8,300	2	$11,300	2	$19,300	10	$124,500

TASK SUB-ACCOUNT 22N **22** **$135,700**

Major Task	Description and Assumptions
Develop GIS Database	GIS information for the Chicago River Basin will be compiled in a GIS database. All new and existing data obtained for this feasibility study will also be included in the GIS database. New and existing data will include, but not be limited to, the following information: sediment quality data, probing location, sediment thickness at probing location, water quality data, land use information, topography, municipal information, wetland delineation, real estate mapping, HTRW sites in the region, utility identification, and infrastructure that may be impacted upon by dredging/disposal operations. The GIS database will be utilized in the formulation and analysis of project measures and alternatives.
Utility Mapping	Verify exiting utilities and utility maps for incorporation into alternative designs and layouts and to identify utility relocations for the recommended project sites. It is assumed that a survey contract will be required. The extent of the mapping contract is vague and is subject to significant changes based on the information available and the specific projects needs as the design develops.
Real Estate Mapping	Utility locations, easements, and relocations will be incorporated into the Real Estate drawing to also establish work limits and additional land acquisition requirements.
3D Display Model	Utilize GIS information, a Digital Elevation Model (DEM), and details of recommended plan to create a 3D Physical Model of the project. Model to be used for display at coordination meetings with the Sponsor and public meetings. Model block max size is 20"x24"x16", multiple blocks can be put together if desired.
Place Design Features	Design process associated with placing design features onto topographic drawings.

Sub-Account 22P - Engineering Analysis and Design / Project Cost Estimate

Federal Costs	Rate ($/day)	Initial Cost Estimates		Design Analysis		Final Cost Estimate		Civil Design Appendix		Total Cost	
		days	$	days	$	days	$	days	$	days	$
Chicago District Labor:											
Technical Services Div.	$1,200	0.5	$600	0.5	$600	0	$0	0.5	$600	1.5	$1,800
Design Branch	$1,200	1	$1,200	1.5	$1,800	0	$0	1.5	$1,800	4	$4,800
Chief, Civil Design Section	$1,000	2.5	$2,500	3	$3,000	0.5	$500	3	$3,000	9	$9,000
Civil Design Engineer	$800	0	$0	16	$12,800	0	$0	15	$12,000	31	$24,800
Cost Engineer	$800	25	$20,000	0	$0	5	$4,000	5	$4,000	35	$28,000
CADD Technician	$600	0	$0	10	$6,000	0	$0	8	$4,800	18	$10,800
Miscellaneous Costs:											
Chicago District CADD Services	$40	0	$0	25	$1,000	0	$0	20	$800	45	$1,800
Total Federal Costs:		29	$24,300	31	$25,200	5.5	$4,500	33	$27,000	98.5	$81,000

Non-Federal Costs	Rate ($/day)	Initial Cost Estimates		Design Analysis		Final Cost Estimate		Civil Design Appendix		Total Cost	
		days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:											
Department of Environment	$650	0	$0	0	$0	0	$0	0	$0	0	$0
Total Non-Federal Costs:		0	$0	0	$0	0	$0	0	$0	0	$0

TASK SUB-ACCOUNT 22P **98.5 $81,000**

Major Task	Description and Assumptions
Preliminary Cost Estimates	Initial cost estimates will be developed for the alternatives considered during the feasibility phase. These cost estimates will be provided to the economist and used in the evaluation of alternatives through the CE/ICA analyses.
Design Analysis / Drawings	Preliminary drawings of project features will be developed and utilized to evaluate the alternatives and to provide a foundation for the detailed design of the final plan. Designs will be developed for the elements of the selected plan, for the purposes of plan illustration, as well as an aid in the development of the final cost estimate. Final Drawings will be prepared during the Preconstruction Engineering Design (PED) phase following the completion of the Feasibility Study phase.
Final Cost Estimate	Final cost estimate includes all deliverables required to prepare life cycle cost estimates needed to support the Feasibility Report and to prepare the baseline project cost estimate. Cost estimates will be developed in accordance with the USACE guidance using the MCACES / MII cost estimating system. Cost estimates will be presented in the Civil Works Breakdown Structure (CWBS). Cost estimates will include both Federal and non-Federal costs for construction; real estate; engineering and design; construction management; environmental, cultural resources; HTRW investigations; operation and maintenance; replacement, repairs and rehabilitation of alternatives; and the recommended project.
Civil Design Appendix	A report containing the results of the design analyses, as well as the preliminary and detailed designs and drawings, will be prepared for inclusion in the Civil Design portion of the Engineering Appendix. This information will be presented for the alternatives as well as the selected plan and will include work limits, temporary and permanent easements, haul routes, staging and storage areas, borrow and disposal sites, and quantity estimates. The report will contain sufficient detail for the development of costs associated with these elements.

Sub-Account 22Q - Feasibility Study Management

Federal Costs	Rate ($/day)	A-E Contract Documents		Project Funds Control		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$
Chicago District Labor:									
Planning, Programs, Project Mgmt Div.	$1,200	1	$1,200	2	$2,400	2	$2,400	5	$6,000
Planning Branch	$1,000	2	$2,000	5	$5,000	5	$5,000	12	$12,000
Environmental & Social Analysis Section	$800	10	$8,000	10	$8,000	20	$16,000	40	$32,000
Programs & Project Management Branch	$1,000	2	$2,000	10	$10,000	10	$10,000	22	$22,000
Miscellaneous Costs:									
Travel and Vehicle Costs							$5,000		$5,000
Total Federal Costs:		15	$13,200	27	$25,400	37	$38,400	79	$77,000

Non-Federal Costs	Rate ($/day)	A-E Contract Documents		Project Funds Control		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$
City of Chicago Labor:									
Department of Environment	$650	0	$0	5	$3,250	10	$6,500	15	$9,750
Total Non-Federal Costs:		0	$0	5	$3,250	10	$6,500	15	$9,750

TASK SUB-ACCOUNT 22Q **94** **$86,750**

Major Task	Description and Assumptions
A-E Contract Documents	An acquisition plan will be prepared that lists the procurement actions, contract amounts, and award schedule for Architect-Engineer (A-E) contracts to be used to complete the study. The cost of obtaining A-E services are included in the study cost estimates of product by sub-account. Each technical discipline is responsible for preparation of negotiation, award, and contract administration documents for the utilization of A-E contractors to complete, or assist in the completion of Feasibility Phase products for their respective disciplines.
Project Funds Control	This task involves the preparation of budgetary documents and reviewing expenditures against the PMP.
Management / Coordination	This task involves the daily overall management of work activities including preparing progress reports, facilitating team activities, coordination with non-Federal sponsors and local stakeholders and reviewing the technical reports generated by the various technical elements.

Sub-Account 22R - Plan Formulation

Federal Costs	Rate ($/day)	Formulation of Alt. Plans		Evaluation of Alt. Plans		Determine NER Plan		Plan Form. Appendix		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
Chicago District Labor:													
Planning, Programs, Project Mgmt Div.	$1,200	1	$1,200	2	$2,400	1	$1,200	1	$1,200	1	$1,200	6	$7,200
Planning Branch	$1,000	5	$5,000	10	$10,000	5	$5,000	5	$5,000	5	$5,000	30	$30,000
Economic & Plan Formulation Section	$800	8	$6,400	10	$8,000	5	$4,000	5	$4,000	5	$4,000	33	$26,400
Environmental & Social Analysis Section	$800	30	$24,000	50	$40,000	30	$24,000	30	$24,000	20	$16,000	160	$128,000
Technical Services Div.	$1,200	1	$1,200	0.5	$600	0	$0	0	$0	0.5	$600	2	$2,400
Design Branch	$1,200	2	$2,400	1	$1,200	1	$1,200	0	$0	1	$1,200	5	$6,000
Chief, Hydraulic & Env. Engineering	$1,000	5	$5,000	3	$3,000	2	$2,000	0	$0	1	$1,000	11	$11,000
Hydraulic & Env. Engineering Section (HH)	$800	5	$4,000	5	$4,000	5	$4,000	0	$0	0	$0	15	$12,000
Hydraulic & Env. Engineering Section (HE)	$800	25	$20,000	10	$8,000	5	$4,000	0	$0	4	$3,200	44	$35,200
Total Federal Costs:		82	$69,200	91.5	$77,200	54	$45,400	41	$34,200	37.5	$32,200	306	$258,200

Non-Federal Costs	Rate ($/day)	Formulation of Alt. Plans		Evaluation of Alt. Plans		Determine NER Plan		Plan Form. Appendix		Management / Coordination		Total Cost	
		days	$	days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:													
Department of Planning	$650	0	$0	0	$0	0	$0	0	$0	20	$13,000	20	$13,000
Department of Environment	$650	0	$0	0	$0	0	$0	0	$0	30	$19,500	30	$19,500
Mayor's Office	$650	0	$0	0	$0	0	$0	0	$0	5	$3,250	5	$3,250
Total Non-Federal Costs:		0	$0	0	$0	0	$0	0	$0	55	$35,750	55	$35,750

TASK SUB-ACCOUNT 22R **361 $293,950**

Major Task	Description and **Assumptions**
Formulation of Alternative Plans	The Study Manager will lead the investigation into identifying possible restoration measures that address the identified problems and opportunities within the Bubbly Creek study area. Measures will include those identified, screened, and retained during the reconnaissance study, including measures that will restore in-channel habitats, restore wetland habitats, restore riparian habitats, reduce stagnant flow conditions, enhance water quality, and identify compatible recreation features, along with any other new measures that can be formulated and screened to address the identified problems and opportunities while meeting study objectives and avoiding constraints.
Evaluation of Alternative Plans	Using the established habitat assessment tool, ecosystem outputs of proposed restoration measures will be determined. The evaluation procedure selected will be based upon established assessment tools that have been successfully utilized in similar environments and will be reviewed and concurred upon by USACE Headquarters prior to the development of the final array of restoration alternatives. The implementation costs, ecosystem benefits, and cumulative benefits of each alternative plan will be evaluated and assessed.
Determine NER Recommended Plan	Based on evaluation results of habitat outputs and the CE/ICA analyses, each alternative plan will be compared and ranked. Plan formulation is an iterative process that involves formulating, evaluating, comparing, and re-formulating plans until an array of unique alternatives that meet the identified objectives within constraints are determined. Through the plan formulation process the National Ecosystem Restoration (NER) plan is identified and recommended that complies with floodplain and water quality permitting requirements and all applicable statutes, executive orders, memoranda, and policies.
Plan Formulation Appendix	A report detailing the plan formulation process will be created in a Plan Formulation Appendix to the Feasibility Report. A summary of the plan formulation process as documented in the Plan Formulation Appendix will be incorporated into the Feasibility Report as the main report section.
Management / Coordination	Management of the plan formulation effort will include such activities as planning and conducting team meetings, upward reporting, preparation of study and project management documents, coordination with the non-Federal sponsor(s) and other agencies, and integration of all technical investigations.

Sub-Account 22S - Feasibility Report Preparation

Federal Costs	Rate ($/day)	Feasibility Scoping Mtg.		Alt. Form. Briefing		Final Report Preparation		Ind. Tech. Review		Total Cost	
		days	$	days	$	days	$	days	$	days	$
Chicago District Labor:											
Planning, Programs, Project Mgmt Div.	$1,200	1	$1,200	1	$1,200	1	$1,200	1	$1,200	4	$4,800
Planning Branch	$1,000	2	$2,000	2	$2,000	2	$2,000	2	$2,000	8	$8,000
Economic & Plan Formulation Section	$800	5	$4,000	5	$4,000	5	$4,000	5	$4,000	20	$16,000
Environmental & Social Analysis Section	$800	15	$12,000	20	$16,000	30	$24,000	20	$16,000	85	$68,000
Programs & Project Management Branch	$1,000	5	$5,000	5	$5,000	5	$5,000	5	$5,000	20	$20,000
Miscellaneous Costs:											
USEPA	$1,000	2	$2,000	2	$2,000	0	$0	10	$10,000	14	$14,000
Other Corps (ITR Team)	$1,000	3	$3,000	3	$3,000	0	$0	20	$20,000	26	$26,000
Total Federal Costs:		33	$29,200	38	$33,200	43	$36,200	63	$58,200	177	$156,800

Non-Federal Costs	Rate ($/day)	Feasibility Scoping Mtg.		Alt. Form. Briefing		Final Report Preparation		Ind. Tech. Review		Total Cost	
		days	$	days	$	days	$	days	$	days	$
City of Chicago Labor:										0	0
Department of Planning	$650	1	$650	1	$650	1	$650	0	$0	3	$1,950
Department of Environment	$650	1	$650	1	$650	1	$650	0	$0	3	$1,950
Department of Legal	$650	1	$650	1	$650	1	$650	0	$0	3	$1,950
Mayor's Office	$650	1	$650	1	$650	1	$650	0	$0	3	$1,950
Department of Water Management	$650	1	$650	1	$650	1	$650	0	$0	3	$1,950
Total Non-Federal Costs:		5	$3,250	5	$3,250	5	$3,250	0	$0	15	$9,750

TASK SUB-ACCOUNT 22S **192 $166,550**

Major Task	Description and Assumptions
Feasibility Scoping Meeting (FSM)	Feasibility Scoping meeting (FSM) is the first of two required interim checkpoint conferences attended by the Chicago District, the non-Federal sponsor(s), the Great Lakes and Ohio River Division (LRD), and Headquarters (HQUSACE). The purpose of the FSM is to review study findings concerning goals and objectives; problem and opportunities; and baseline and future without project conditions. This activity involves the preparation of required documentation, meeting coordination and attendance by required parties.
Alternative Formulation Briefing (FSM)	Alternative Formulation Briefing (AFB) is the second of two required interim checkpoint conferences attended by the Chicago District, the non-Federal sponsor(s), the Great Lakes and Ohio River Division (LRD), and Headquarters (HQUSACE). The purpose of the AFB is to review study findings concerning measures formulated to address ecosystem problems and opportunities; to evaluate the array of alternatives and determine their consistency with the Federal interest; and to review the preliminary analysis of the environmental, economic, social and regional impacts of alternatives. The AFB will be scheduled when technical studies, such as hydrologic modeling and baseline environmental investigations, have progressed to the point where a determination can be made on whether potential alternatives are in the Federal interest. This activity involves the preparation of required documentation, meeting coordination and attendance by required parties.

Sub-Account 22S - Feasibility Report Preparation (continued)

Major Task	Description and Assumptions
Final Report Preparation	The Study Manager will assemble the Final Feasibility Report and Final NEPA document. The costs of preparing the final NEPA document and the technical appendices are included under other Sub-Accounts. The Final Feasibility Report will incorporate comments from agencies, the public, and higher authority USACE review. The PDT will perform reviews of the draft and Final Feasibility Report in accordance with the project and District Quality Control Plans (QCPs).
Independent Technical Reviews (ITR)	The Independent Technical Review (ITR) is intended to be on going throughout product development, using a team concept, not a cumulative process performed at the end. The ITR team will perform an adequacy and policy compliance review of the Feasibility Report. The particular aspects of the Feasibility product on which the ITR team will concentrate its focus include the following technical and policy criteria: conformance to basic planning principles relative to the identification, evaluation, and recommendation of project plans. Technical reviews will be performed by a combination of independent experts within USACE, other Federal agencies, private consultants, and/or the Non-Federal sponsor(s). Documentation, as outlined in the District Quality Management Plan (QMP) and the QCP for the feasibility study will be provided by the Study Manager. Policy compliance reviews are completed at the USACE Division and Headquarter levels and are intended to resolve policy concerns that might otherwise delay or preclude approval of the Feasibility Report.

Sub-Account 22T - Programs and Project Management

Federal Costs	Rate ($/day)	Project Management		Sponsor Coordination		Total Cost	
		days	$	days	$	days	$
Chicago District Labor:							
Planning, Programs, Project Mgmt Div.	$1,200	2	$2,400	5	$6,000	7	$8,400
Programs & Project Management Branch	$1,000	40	$40,000	10	$10,000	50	$50,000
Total Federal Costs:		42	$42,400	15	$16,000	57	$58,400

Non-Federal Costs	Rate ($/day)	Project Management		Sponsor Coordination		Total Cost	
		days	$	days	$	days	$
City of Chicago Labor:							
Department of Environment	$650	15	$9,750	5	$3,250	20	$13,000
Total Non-Federal Costs:		15	$9,750	5	$3,250	20	$13,000

TASK SUB-ACCOUNT 22T **77** **$71,400**

Major Task	Description and Assumptions
Project Management	The Chicago District Project Manager will monitor expenditures, keep the PMP current, prepare project management reports, report to the Chicago District Project Review Board (PRB), report to the Executive Steering Committee (ESC), and report study status and issues to the District Commander. Updates of PMP will include regular finance and accounting reports regarding expenditures and obligations, executive summary reports for the PRB, schedule and cost changes, and changes to work elements. Budget preparation, correspondence, inter-organizational coordination, and point-of-contact responsibilities are part of project management.
Sponsor Coordination	The Chicago District Project Manager will coordinate with the non-Federal Sponsor on various issues that arise during the project including public affairs issues.

Sub-Account 22V - Initial Draft PCA and PED Agreement

Federal Costs	Rate ($/day)	Draft PCA		Draft PED Agreement		Total Cost	
		days	$	days	$	days	$
Chicago District Labor:							
Planning, Programs, Project Mgmt Div.	$1,200	1	$1,200	1	$1,200	2	$2,400
Planning Branch	$1,000	2	$2,000	2	$2,000	4	$4,000
Environmental & Social Analysis Section	$800	5	$4,000	5	$4,000	10	$8,000
Programs & Project Management Branch	$1,000	10	$10,000	10	$10,000	20	$20,000
Total Federal Costs:		18	$17,200	18	$17,200	36	$34,400

Non-Federal Costs	Rate ($/day)	Draft PCA		Draft PED Agreement		Total Cost	
		days	$	days	$	days	$
City of Chicago Labor:							
Department of Planning	$650	3	$1,950	2	$1,300	5	$3,250
Department of Environment	$650	5	$3,250	4	$2,600	9	$5,850
Department of Legal	$650	1	$650	1	$650	2	$1,300
Mayor's Office	$650	3	$1,950	2	$1,300	5	$3,250
Total Non-Federal Costs:		12	$7,800	9	$5,850	21	$13,650

TASK SUB-ACCOUNT 22V **TOTAL: 57 $48,050**

Major Task	Description and Assumptions
Draft Project Cooperation Agreement (PCA)	A draft Project Cooperation Agreement (PCA) for implementation of the recommended plan will be developed during the final stages of the feasibility study process. The PCA will be finalized during Preconstruction Engineering & Design (PED) phase.
Draft Preconstruction Engineering and Design (PED) Agreement	The Preconstruction Engineering and Design (PED) Agreement will include all Federal and non-Federal costs for PED from the date of the Commander's Notice to award of the first construction contract. PED activities may begin after negotiating and executing the PED Agreement. A draft PED agreement will be developed during the final stages of the feasibility study process and coordinated with the non-Federal sponsor(s) and the Corps review levels as appropriate. The Final PED agreement will be finalized after project authorization.

Sub-Account 22Y - Washington Level Review

Federal Costs	Rate ($/day)	Washington Level Review days	Washington Level Review $	Total Cost days	Total Cost $
Miscellaneous Costs:					
Washington Level Review Funds Allocation			$25,000		$25,000
Total Federal Costs:		0	$25,000	0	$25,000

Non-Federal Costs	Rate ($/day)	Washington Level Review days	Washington Level Review $	Total Cost days	Total Cost $
Miscellaneous Costs:					
Washington Level Review Funds Allocation			$25,000		$25,000
Total Non-Federal Costs:		0	$25,000	0	$25,000

TASK SUB-ACCOUNT 22A **0** **$50,000**

Major Task	Description and Assumptions
Washington Level Review	This task includes activities necessary for submittal of the Final Feasibility Report to Congress after completion of all levels of review. To ensure that the non-Federal sponsor(s) is afforded an opportunity to participate in any significant effort as a result of Washington level review including the Civil Works Review Board (CWRB), funding for the District and the non-Federal sponsor(s) are included as a separate work item in the PMP. These costs, including any necessary travel to USACEHQ, will be limited to those reasonable costs associated with the review and processing of the Feasibility Report. In accordance with EC 1105-2-108, this item will be 5 percent of the total study cost or $50,000, whichever is less, and will be cost-shared equally between the Corps of Engineers and the non-Federal sponsor(s). Accordingly, $50,000 is included in the estimate for this task.

Sub-Account 22Z - Peer Review Plan

Federal Costs	Rate ($/day)	Peer Review Plan		External Peer Review		Total Cost	
		days	$	days	$	days	$
Chicago District Labor:							
Planning, Programs, Project Mgmt Div.	$1,200	0	$0	0	$0	0	$0
Planning Branch	$1,000	1	$1,000	0	$0	1	$1,000
Environmental & Social Analysis Section	$800	5	$4,000	0	$0	5	$4,000
Programs & Project Management Branch	$1,000	2	$2,000	0	$0	2	$2,000
Miscellaneous Costs:							
Nat. Ecosystem Restoration PCX (ECO-PCX)					$50,000		$50,000
Total Federal Costs:		8	$7,000	0	$50,000	8	$57,000

Non-Federal Costs	Rate ($/day)	Peer Review Plan		External Peer Review		Total Cost	
		days	$	days	$	days	$
City of Chicago Labor:							
Department of Planning	$1,200	0	$0	0	$0	0	$0
Department of Environment	$1,200	0	$0	0	$0	0	$0
Total Non-Federal Costs:		0	$0	0	$0	0	$0

TASK SUB-ACCOUNT 22Z **8** **$57,000**

Major Task	Description and Assumptions
Peer Review Plan	This task includes activities necessary to complete the peer review plan. The peer review plan will be published on the web and will contain all of the information required in paragraph 6 of EC 1105-2-148.
External Peer Review	This task includes activities necessary for the National Ecosystem Restoration Planning Center of Expertise (ECO-PCX) to coordinate the completion of an external peer review (EPR) in accordance with EC 1105-2-408.

ATTACHMENT B

SUMMARY OF COSTS BY ORGANIZATION

Summary of Feasibility Phase Costs by Organization

Federal Costs	22A	22B	22C	22D	22E	22F	22G	22H	22J	22K	22L	22N	22P	22Q	22R	22S	22T	22V	22Y	22Z	Total by Org
Chicago District Labor																					
Planning, Programs, Project Mgmt. Div.	$1,200	$1,800	$0	$0	$6,000	$0	$1,200	$0	$0	$0	$0	$0	$0	$6,000	$7,200	$4,800	$8,400	$2,400	$0	$0	$39,000
Planning Branch	$2,000	$3,000	$500	$1,000	$23,000	$1,000	$2,000	$0	$0	$0	$0	$1,000	$0	$12,000	$30,000	$8,000	$0	$4,000	$0	$1,000	$88,500
Economic & Plan Formulation Section	$3,200	$16,000	$0	$0	$0	$0	$12,000	$0	$0	$0	$0	$0	$0	$0	$26,400	$16,000	$0	$0	$0	$0	$73,600
Environmental & Social Analysis Section	$3,200	$0	$2,400	$2,400	$76,000	$8,000	$20,000	$0	$0	$0	$0	$0	$0	$32,000	$128,000	$68,000	$0	$8,000	$0	$4,000	$352,000
Programs & Project Management Branch	$2,000	$0	$0	$0	$18,000	$0	$0	$0	$0	$0	$0	$0	$0	$22,000	$0	$20,000	$50,000	$20,000	$0	$2,000	$134,000
Technical Services Div.	$0	$0	$0	$0	$2,400	$0	$0	$0	$3,600	$3,600	$1,200	$600	$1,800	$0	$2,400	$0	$0	$0	$0	$0	$15,600
Design Branch	$0	$0	$0	$0	$3,600	$0	$0	$0	$11,000	$6,000	$3,600	$600	$4,800	$0	$6,000	$0	$0	$0	$0	$0	$35,600
Chief, Hydraulic & Env. Engineering	$0	$0	$0	$0	$8,000	$0	$0	$0	$0	$0	$8,000	$0	$0	$0	$11,000	$0	$0	$0	$0	$0	$27,000
Hydraulic & Env. Engineering Section (HE)	$0	$0	$0	$0	$40,000	$0	$0	$0	$0	$0	$37,600	$0	$0	$0	$35,200	$0	$0	$0	$0	$0	$112,800
Hydraulic & Env. Engineering Section (HH)	$0	$0	$0	$0	$0	$0	$0	$0	$97,600	$0	$0	$0	$0	$0	$12,000	$0	$0	$0	$0	$0	$109,600
Geotechnical Engineering Section	$0	$0	$0	$0	$0	$0	$0	$0	$0	$95,000	$0	$3,000	$0	$0	$0	$0	$0	$0	$0	$0	$98,000
Chief, Civil Design Section	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,000	$9,000	$0	$0	$0	$0	$0	$0	$0	$11,000
Civil Design Engineer	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,000	$24,800	$0	$0	$0	$0	$0	$0	$0	$28,800
CADD Technician	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10,800	$0	$0	$0	$0	$0	$0	$0	$10,800
Cost Engineer	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,000	$0	$0	$0	$0	$0	$0	$0	$28,000
Chicago District Miscellaneous Costs																					
Contractual Services	$0	$0	$0	$0	$0	$0	$0	$0	$160,000	$172,000	$75,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$407,000
Contractual Surveys	$0	$0	$0	$0	$45,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$45,000
Other Corps (e.g. ERDC-WES, ITR Team)	$0	$0	$0	$0	$0	$0	$0	$0	$150,000	$60,000	$0	$0	$0	$0	$0	$26,000	$0	$0	$0	$0	$236,000
Miscellaneous	$0	$0	$0	$0	$2,000	$15,000	$0	$0	$0	$0	$0	$0	$1,800	$5,000	$0	$14,000	$0	$0	$25,000	$50,000	$112,800
Detroit District Labor																					
Real Estate Div.	$0	$0	$0	$0	$0	$0	$0	$6,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,000
Acquisition Branch	$0	$0	$0	$0	$0	$0	$0	$25,200	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$25,200
Appraisal Branch	$0	$0	$0	$0	$0	$0	$0	$12,600	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$12,600

Non-Federal Costs	22A	22B	22C	22D	22E	22F	22G	22H	22J	22K	22L	22N	22P	22Q	22R	22S	22T	22V	22Y	22Z	Total by Org
City of Chicago Labor																					
Department of Planning	$11,700	$0	$3,250	$3,250	$0	$0	$0	$1,300	$0	$0	$0	$0	$0	$0	$13,000	$1,950	$0	$3,250	$0	$0	$37,700
Department of Environment	$3,250	$650	$650	$650	$5,850	$0	$0	$4,550	$5,200	$4,550	$9,100	$6,500	$0	$9,750	$19,500	$1,950	$13,000	$5,850	$0	$0	$91,000
Mayor's Office	$2,600	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,250	$1,950	$0	$3,250	$0	$0	$11,050
Department of Water Management	$0	$0	$0	$0	$0	$0	$0	$0	$5,200	$0	$0	$0	$0	$0	$0	$1,950	$0	$0	$0	$0	$7,150
Department of Legal	$0	$3,250	$0	$0	$0	$0	$0	$5,200	$0	$0	$0	$0	$0	$0	$0	$1,950	$0	$1,300	$0	$0	$11,700
City of Chicago Miscellaneous Costs																					
Contractual Services	$30,000	$0	$26,000	$56,000	$32,500	$0	$0	$43,500	$0	$27,500	$50,000	$58,000	$0	$0	$0	$0	$0	$0	$0	$0	$323,500
Contractual Surveys	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$70,000	$50,000	$0	$0	$0	$0	$0	$0	$0	$0	$120,000
Miscellaneous	$0	$0	$0	$0	$0	$0	$0	$4,000	$0	$0	$0	$10,000	$0	$0	$0	$0	$0	$0	$25,000	$0	$39,000

Totals by Sub-Account	$59,150	$24,700	$32,800	$63,300	$262,350	$24,000	$35,200	$102,350	$432,600	$368,650	$254,500	$135,700	$81,000	$86,750	$293,950	$166,550	$71,400	$48,050	$50,000	$57,000	$2,650,000

ATTACHMENT C

SUMMARY OF COSTS BY FISCAL YEAR

Summary of Feasibility Phase Costs by Fiscal Year

SUB-ACCOUNT	DESCRIPTION	TOTAL COST	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011	
			Fed	Non-Fed	Fed	Non-Fed	Fed	Non-Fed	Fed	Non-Fed	Fed	Non-Fed
22A	Public Involvement	$59,150	$0	$17,600	$5,800	$11,500	$0	$8,250	$5,800	$10,200	$0	$0
22B	Institutional Studies	$24,700	$0	$0	$0	$0	$0	$0	$20,800	$3,900	$0	$0
22C	Social Studies	$32,800	$0	$0	$800	$6,650	$800	$10,650	$1,300	$12,600	$0	$0
22D	Cultural Resources Studies	$63,300	$0	$0	$0	$31,650	$800	$8,650	$2,600	$19,600	$0	$0
22E	Environmental Studies	$262,350	$27,000	$0	$100,200	$34,450	$33,000	$1,950	$63,800	$1,950	$0	$0
22F	Fish and Wildlife Studies	$24,000	$0	$0	$0	$0	$24,000	$0	$0	$0	$0	$0
22G	Economic Studies	$35,200	$0	$0	$0	$0	$35,200	$0	$0	$0	$0	$0
22H	Real Estate Analysis	$102,350	$0	$0	$10,350	$15,300	$27,250	$43,250	$6,200	$0	$0	$0
22J	Hydrology/Hydraulics Studies	$432,600	$173,200	$0	$124,200	$7,800	$118,600	$2,600	$6,200	$0	$0	$0
22K	Geotechnical Studies	$368,650	$0	$0	$141,600	$21,950	$171,800	$10,100	$23,200	$0	$0	$0
22L	HTRW Assessments	$254,500	$0	$0	$8,300	$52,600	$117,100	$76,500	$0	$0	$0	$0
22N	Surveys and Mapping	$135,700	$0	$0	$3,700	$85,600	$5,500	$27,600	$2,000	$11,300	$0	$0
22P	Design/Project Cost Estimates	$81,000	$0	$0	$0	$0	$67,400	$0	$13,600	$0	$0	$0
22Q	Planning Technical Management	$86,750	$6,000	$1,000	$26,500	$3,000	$28,500	$3,500	$16,000	$2,250	$0	$0
22R	Plan Formulation and Evaluation	$293,950	$0	$0	$15,000	$14,300	$193,000	$14,300	$50,200	$7,150	$0	$0
22S	Feasibility Report Preparation	$166,550	$0	$0	$29,200	$3,250	$33,200	$3,250	$94,400	$3,250	$0	$0
22T	Programs and Project Management	$71,400	$2,000	$1,300	$18,600	$3,900	$21,600	$3,900	$16,200	$3,900	$0	$0
22V	Initial Draft PCA and PED Agreement	$48,050	$0	$0	$0	$0	$0	$0	$17,200	$7,800	$17,200	$5,850
22Y	Washington Level Review	$50,000	$0	$0	$0	$0	$0	$0	$0	$0	$25,000	$25,000
22Z	Peer Review Plan	$57,000	$0	$0	$0	$0	$0	$0	$28,500	$0	$28,500	$0
BASE:		$2,650,000	$208,200	$19,900	$484,250	$291,950	$877,750	$214,500	$368,000	$83,900	$70,700	$30,850

Summary of Fed/Non-Fed Funding

Fiscal Year	Total	Federal Funds	Non-Fed Contributions	
			Cash	WIK Credit
2007	$228,100	$114,050	$94,150	$19,900
2008	$776,200	$388,100	$96,150	$291,950
2009	$1,092,250	$546,125	$331,625	$214,500
2010	$451,900	$225,950	$142,050	$83,900
2011	$101,550	$50,775	$19,925	$30,850
Total	$2,650,000	$1,325,000	$683,900	$641,100

Sub-Account 22A - Public Involvement

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$1,200	$0	$600	$0	$600	$0
Planning Branch	$2,000	$0	$1,000	$0	$1,000	$0
Economic & Plan Formulation Section	$3,200	$0	$1,600	$0	$1,600	$0
Environmental & Social Analysis Section	$3,200	$0	$1,600	$0	$1,600	$0
Programs & Project Management Branch	$2,000	$0	$1,000	$0	$1,000	$0
Total Federal Costs:	$11,600	$0	$5,800	$0	$5,800	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$11,700	$2,600	$3,900	$2,600	$2,600	$0
Department of Environment	$3,250	$0	$1,300	$650	$1,300	$0
Mayor's Office	$2,600	$0	$1,300	$0	$1,300	$0
Miscellaneous Costs:						
Contractual Project Website	$30,000	$15,000	$5,000	$5,000	$5,000	$0
Total Non-Federal Costs:	$47,550	$17,600	$11,500	$8,250	$10,200	$0

Sub-Account 22B - Institutional Studies/Report

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$1,800	$0	$0	$0	$1,800	$0
Planning Branch	$3,000	$0	$0	$0	$3,000	$0
Economic & Plan Formulation Section	$16,000	$0	$0	$0	$16,000	$0
Total Federal Costs:	$20,800	$0	$0	$0	$20,800	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$650	$0	$0	$0	$650	$0
Department of Legal	$3,250	$0	$0	$0	$3,250	$0
Total Non-Federal Costs:	$3,900	$0	$0	$0	$3,900	$0

Sub-Account 22C - Social Resources Studies

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$0	$0	$0	$0	$0	$0
Planning Branch	$500	$0	$0	$0	$500	$0
Environmental & Social Analysis Section	$2,400	$0	$800	$800	$800	$0
Total Federal Costs:	$2,900	$0	$800	$800	$1,300	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$3,250	$0	$650	$650	$1,950	$0
Department of Environment	$650	$0	$0	$0	$650	$0
Miscellaneous Costs:						
Contractual Services	$26,000	$0	$6,000	$10,000	$10,000	$0
Total Non-Federal Costs:	$29,900	$0	$6,650	$10,650	$12,600	$0

Sub-Account 22D - Cultural Resources Studies

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$0	$0	$0	$0	$0	$0
Planning Branch	$1,000	$0	$0	$0	$1,000	$0
Environmental & Social Analysis Section	$2,400	$0	$0	$800	$1,600	$0
Total Federal Costs:	$3,400	$0	$0	$800	$2,600	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$3,250	$0	$650	$650	$1,950	$0
Department of Environment	$650	$0	$0	$0	$650	$0
Miscellaneous Costs:						
Contractual Services	$56,000	$0	$31,000	$8,000	$17,000	$0
Total Non-Federal Costs:	$59,900	$0	$31,650	$8,650	$19,600	$0

Sub-Account 22E - Environmental Resources Study

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$6,000	$0	$2,400	$1,800	$1,800	$0
Planning Branch	$23,000	$2,000	$13,000	$4,000	$4,000	$0
Environmental & Social Analysis Section	$76,000	$2,000	$38,000	$16,000	$20,000	$0
Programs & Project Management Branch	$18,000	$500	$6,500	$5,000	$6,000	$0
Technical Services Div.	$2,400	$0	$600	$600	$1,200	$0
Design Branch	$3,600	$0	$1,200	$600	$1,800	$0
Chief, Hydraulic & Env. Engineering	$8,000	$500	$1,500	$1,000	$5,000	$0
Hydraulic & Env. Engineering Section (HE)	$40,000	$2,000	$10,000	$4,000	$24,000	$0
Miscellaneous Costs:						
Equipment Use for Biological Field Sampling	$2,000	$0	$2,000	$0	$0	$0
Contractual Water Quality Survey	$20,000	$20,000	$0	$0	$0	$0
Contractual Sediment Flux Survey	$25,000	$0	$25,000	$0	$0	$0
Total Federal Costs:	$224,000	$27,000	$100,200	$33,000	$63,800	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$5,850	$0	$1,950	$1,950	$1,950	$0
Miscellaneous Costs:						
Contractual Services	$32,500	$0	$32,500	$0	$0	$0
Total Non-Federal Costs:	$38,350	$0	$34,450	$1,950	$1,950	$0

Sub-Account 22F - Fish & Wildlife Coordination Act Report

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$0	$0	$0	$0	$0	$0
Planning Branch	$1,000	$0	$0	$1,000	$0	$0
Environmental & Social Analysis Section	$8,000	$0	$0	$8,000	$0	$0
Miscellaneous Costs:						
USFWS Coordination Act Reimbursement	$15,000	$0	$0	$15,000	$0	$0
Total Federal Costs:	$24,000	$0	$0	$24,000	$0	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$0	$0	$0	$0	$0	$0
Department of Environment	$0	$0	$0	$0	$0	$0
Total Non-Federal Costs:	$0	$0	$0	$0	$0	$0

Sub-Account 22G - Economic Analyses

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$1,200	$0	$0	$1,200	$0	$0
Planning Branch	$2,000	$0	$0	$2,000	$0	$0
Economic & Plan Formulation Section	$12,000	$0	$0	$12,000	$0	$0
Environmental & Social Analysis Section	$20,000	$0	$0	$20,000	$0	$0
Total Federal Costs:	$35,200	$0	$0	$35,200	$0	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$0	$0	$0	$0	$0	$0
Department of Environment	$0	$0	$0	$0	$0	$0
Total Non-Federal Costs:	$0	$0	$0	$0	$0	$0

Sub-Account 22H - Real Estate Analysis & Documents

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Detroit District Labor:						
Real Estate Div.	$6,000	$0	$1,200	$3,600	$1,200	$0
Acquisition Branch	$25,200	$0	$7,350	$12,850	$5,000	$0
Appraisal Branch	$12,600	$0	$1,800	$10,800	$0	$0
Total Federal Costs:	$43,800	$0	$10,350	$27,250	$6,200	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$1,300	$0	$1,300	$0	$0	$0
Department of Environment	$4,550	$0	$4,550	$0	$0	$0
Department of Legal	$5,200	$0	$1,950	$3,250	$0	$0
Miscellaneous Costs:						
Contractual Services	$47,500	$0	$7,500	$40,000	$0	$0
Contractual Title Search	$0	$0	$0	$0	$0	$0
Total Non-Federal Costs:	$58,550	$0	$15,300	$43,250	$0	$0

Sub-Account 22J - Hydrologic and Hydraulic Studies

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Technical Services Div.	$3,600	$1,200	$1,200	$600	$600	$0
Design Branch	$11,000	$2,000	$4,000	$3,000	$2,000	$0
Hydraulic & Env. Engineering Section (HH)	$97,600	$10,000	$44,000	$40,000	$3,600	$0
Miscellaneous Costs:						
Contractual H&H Analyses	$160,000	$160,000	$0	$0	$0	$0
Other Corps (ERDC-WES)	$150,000	$0	$75,000	$75,000	$0	$0
Total Federal Costs:	$422,200	$173,200	$124,200	$118,600	$6,200	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$5,200	$0	$3,900	$1,300	$0	$0
Department of Water Management	$5,200	$0	$3,900	$1,300	$0	$0
Total Non-Federal Costs:	$10,400	$0	$7,800	$2,600	$0	$0

Sub-Account 22K - Geotechnical Studies

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Technical Services Div.	$3,600	$0	$600	$1,800	$1,200	$0
Design Branch	$6,000	$0	$1,000	$3,000	$2,000	$0
Geotechnical Engineering Section	$95,000	$0	$10,000	$65,000	$20,000	$0
Miscellaneous Costs:						
Contractual Subsurface Inv. & Soils Labs	$172,000	$0	$130,000	$42,000	$0	$0
Other Corps (ERDC-WES)	$60,000	$0	$0	$60,000	$0	$0
Total Federal Costs:	$336,600	$0	$141,600	$171,800	$23,200	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$4,550	$0	$1,950	$2,600	$0	$0
Miscellaneous Costs:						
Contractual Services	$27,500	$0	$20,000	$7,500	$0	$0
Total Non-Federal Costs:	$32,050	$0	$21,950	$10,100	$0	$0

Sub-Account 22L - Hazardous Toxic Radioactive Waste (HTRW) Studies

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Technical Services Div.	$1,200	$0	$600	$600	$0	$0
Design Branch	$3,600	$0	$1,200	$2,400	$0	$0
Chief, Hydraulic & Env. Engineering	$8,000	$0	$2,500	$5,500	$0	$0
Hydraulic & Env. Engineering Section	$37,600	$0	$4,000	$33,600	$0	$0
Miscellaneous Costs:						
Contractual Sediment Investigation	$75,000	$0	$0	$75,000	$0	$0
Total Federal Costs:	$125,400	$0	$8,300	$117,100	$0	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$9,100	$0	$2,600	$6,500	$0	$0
Miscellaneous Costs:						
Contractual Services	$50,000	$0	$50,000	$0	$0	$0
Contractual Soil Investigation	$70,000	$0	$0	$70,000	$0	$0
Total Non-Federal Costs:	$129,100	$0	$52,600	$76,500	$0	$0

Sub-Account 22N - Surveying & Mapping

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$0	$0	$0	$0	$0	$0
Planning Branch (GIS)	$1,000	$0	$1,000	$0	$0	$0
Technical Services Div.	$600	$0	$0	$600	$0	$0
Design Branch	$600	$0	$0	$600	$0	$0
Chief, Civil Design Section	$2,000	$0	$500	$1,500	$0	$0
Civil Design Engineer	$4,000	$0	$1,200	$2,800	$0	$0
CADD Technician	$0	$0	$0	$0	$0	$0
Geotechnical Engineering Section	$3,000	$0	$1,000	$0	$2,000	$0
Total Federal Costs:	$11,200	$0	$3,700	$5,500	$2,000	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$6,500	$0	$2,600	$2,600	$1,300	$0
Miscellaneous Costs:						
Contractual Services	$58,000	$0	$33,000	$25,000	$0	$0
Contractual Survey	$50,000	$0	$50,000	$0	$0	$0
Contractual 3D Display Model	$10,000	$0	$0	$0	$10,000	$0
Total Non-Federal Costs:	$124,500	$0	$85,600	$27,600	$11,300	$0

Sub-Account 22P - Engineering Analysis and Design / Project Cost Estimate

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Technical Services Div.	$1,800	$0	$0	$1,200	$600	$0
Design Branch	$4,800	$0	$0	$3,000	$1,800	$0
Chief, Civil Design Section	$9,000	$0	$0	$7,000	$2,000	$0
Civil Design Engineer	$24,800	$0	$0	$20,800	$4,000	$0
Cost Engineer	$28,000	$0	$0	$26,000	$2,000	$0
CADD Technician	$10,800	$0	$0	$8,400	$2,400	$0
Miscellaneous Costs:						
Chicago District CADD Services	$1,800	$0	$0	$1,000	$800	$0
Total Federal Costs:	$81,000	$0	$0	$67,400	$13,600	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$0	$0	$0	$0	$0	$0
Total Non-Federal Costs:	$0	$0	$0	$0	$0	$0

Sub-Account 22Q - Feasibility Study Management

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$6,000	$0	$2,500	$2,500	$1,000	$0
Planning Branch	$12,000	$1,500	$4,500	$4,500	$1,500	$0
Environmental & Social Analysis Section	$32,000	$2,000	$10,000	$12,000	$8,000	$0
Programs & Project Management Branch	$22,000	$2,000	$8,000	$8,000	$4,000	$0
Miscellaneous Costs:						
Travel and Vehicle Costs	$5,000	$500	$1,500	$1,500	$1,500	$0
Total Federal Costs:	$77,000	$6,000	$26,500	$28,500	$16,000	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$9,750	$1,000	$3,000	$3,500	$2,250	$0
Total Non-Federal Costs:	$9,750	$1,000	$3,000	$3,500	$2,250	$0

Sub-Account 22R - Plan Formulation

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$7,200	$0	$0	$3,600	$3,600	$0
Planning Branch	$30,000	$0	$1,000	$20,000	$9,000	$0
Economic & Plan Formulation Section	$26,400	$0	$2,400	$18,000	$6,000	$0
Environmental & Social Analysis Section	$128,000	$0	$6,000	$100,000	$22,000	$0
Technical Services Div.	$2,400	$0	$0	$1,200	$1,200	$0
Design Branch	$6,000	$0	$600	$4,200	$1,200	$0
Chief, Hydraulic & Env. Engineering	$11,000	$0	$1,000	$8,000	$2,000	$0
Hydraulic & Env. Engineering Section (HH)	$12,000	$0	$2,000	$8,000	$2,000	$0
Hydraulic & Env. Engineering Section (HE)	$35,200	$0	$2,000	$30,000	$3,200	$0
Total Federal Costs:	$258,200	$0	$15,000	$193,000	$50,200	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$13,000	$0	$5,000	$5,000	$3,000	$0
Department of Environment	$19,500	$0	$8,000	$8,000	$3,500	$0
Mayor's Office	$3,250	$0	$1,300	$1,300	$650	$0
Total Non-Federal Costs:	$35,750	$0	$14,300	$14,300	$7,150	$0

Sub-Account 22S - Feasibility Report Preparation

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$4,800	$0	$1,200	$1,200	$2,400	$0
Planning Branch	$8,000	$0	$2,000	$2,000	$4,000	$0
Economic & Plan Formulation Section	$16,000	$0	$4,000	$4,000	$8,000	$0
Environmental & Social Analysis Section	$68,000	$0	$12,000	$16,000	$40,000	$0
Programs & Project Management Branch	$20,000	$0	$5,000	$5,000	$10,000	$0
Miscellaneous Costs:						
USEPA	$14,000	$0	$2,000	$2,000	$10,000	$0
Other Corps (ITR Team)	$26,000	$0	$3,000	$3,000	$20,000	$0
Total Federal Costs:	$156,800	$0	$29,200	$33,200	$94,400	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$1,950	$0	$650	$650	$650	$0
Department of Environment	$1,950	$0	$650	$650	$650	$0
Department of Legal	$1,950	$0	$650	$650	$650	$0
Mayor's Office	$1,950	$0	$650	$650	$650	$0
Department of Water Management	$1,950	$0	$650	$650	$650	$0
Total Non-Federal Costs:	$9,750	$0	$3,250	$3,250	$3,250	$0

Sub-Account 22T - Programs and Project Management

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$8,400	$0	$3,600	$3,600	$1,200	$0
Programs & Project Management Branch	$50,000	$2,000	$15,000	$18,000	$15,000	$0
Total Federal Costs:	$58,400	$2,000	$18,600	$21,600	$16,200	$0

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Environment	$13,000	$1,300	$3,900	$3,900	$3,900	$0
Total Non-Federal Costs:	$13,000	$1,300	$3,900	$3,900	$3,900	$0

Sub-Account 22V - Initial Draft PCA and PED Agreement

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$2,400	$0	$0	$0	$1,200	$1,200
Planning Branch	$4,000	$0	$0	$0	$2,000	$2,000
Economic & Plan Formulation Section	$8,000	$0	$0	$0	$4,000	$4,000
Programs & Project Management Branch	$20,000	$0	$0	$0	$10,000	$10,000
Total Federal Costs:	$34,400	$0	$0	$0	$17,200	$17,200

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$3,250	$0	$0	$0	$1,950	$1,300
Department of Environment	$5,850	$0	$0	$0	$3,250	$2,600
Department of Legal	$1,300	$0	$0	$0	$650	$650
Mayor's Office	$3,250	$0	$0	$0	$1,950	$1,300
Total Non-Federal Costs:	$13,650	$0	$0	$0	$7,800	$5,850

Sub-Account 22Y - Washington Level Review

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Miscellaneous Costs:						
Washington Level Review Funds Allocation	$25,000	$0	$0	$0	$0	$25,000
Total Federal Costs:	$25,000	$0	$0	$0	$0	$25,000

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Miscellaneous Costs:						
Washington Level Review Funds Allocation	$25,000	$0	$0	$0	$0	$25,000
Total Non-Federal Costs:	$25,000	$0	$0	$0	$0	$25,000

Sub-Account 22Z - Peer Review Plan

Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Chicago District Labor:						
Planning, Programs, Project Mgmt Div.	$0	$0	$0	$0	$0	$0
Planning Branch	$1,000	$0	$0	$0	$500	$500
Environmental & Social Analysis Section	$4,000	$0	$0	$0	$2,000	$2,000
Programs & Project Management Branch	$2,000	$0	$0	$0	$1,000	$1,000
Miscellaneous Costs:						
Nat. Ecosystem Restoration PCX (ECO-PCX)	$50,000	$0	$0	$0	$25,000	$25,000
Total Federal Costs:	$57,000	$0	$0	$0	$28,500	$28,500

Non-Federal Costs	Total Cost	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
City of Chicago Labor:						
Department of Planning	$0	$0	$0	$0	$0	$0
Department of Environment	$0	$0	$0	$0	$0	$0
Total Non-Federal Costs:	$0	$0	$0	$0	$0	$0

ATTACHMENT D

SCHEDULE OF ACTIVITIES

Feasibility Phase Schedule by Major Activity

SUB-ACCT	MAJOR ACTIVITY	TOTAL DURATION	FY - 07				FY - 08				FY - 09				FY - 10				FY - 11			
			1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th	1st Q	2nd Q	3rd Q	4th Q
22A	Public Meetings	0Y - 2Q						XXXXX								XXXXX						
22A	Project Website	3Y - 0Q				XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX					
22B	Legal/Institutional Analysis	0Y - 2Q													XXXXX	XXXXX						
22B	Ability to Pay Analysis	0Y - 2Q													XXXXX	XXXXX						
22B	Financing Plan for Project Implementation	0Y - 2Q													XXXXX	XXXXX						
22C	Social Resources Analysis / Impacts	1Y - 0Q					XXXXX	XXXXX				XXXXX	XXXXX									
22D	Cultural Resources Analysis / Impacts	1Y - 0Q					XXXXX	XXXXX				XXXXX	XXXXX									
22D	Archeological Survey	0Y - 2Q							XXXXX	XXXXX												
22D	Section 106 Consultation	1Y - 1Q												XXXXX	XXXXX							
22E	Inventory of Environmental Resources	0Y - 3Q				XXXXX	XXXXX	XXXXX	XXXXX	XXXXX												
22E	Establish Restoration Goals & Objectives	0Y - 3Q					XXXXX	XXXXX	XXXXX													
22E	Develop Habitat Assessment Tool	1Y - 0Q						XXXXX	XXXXX	XXXXX	XXXXX											
22E	NEPA Documentation	1Y - 0Q												XXXXX	XXXXX	XXXXX	XXXXX					
22F	USFWS Coordination Act Report	1Y - 0Q									XXXXX	XXXXX	XXXXX	XXXXX								
22G	Determine Socio-Economic Benefits	0Y - 2Q										XXXXX	XXXXX									
22G	Perform CE/ICA Analysis	0Y - 2Q											XXXXX	XXXXX								
22H	Determine LERRDs	0Y - 2Q											XXXXX	XXXXX								
22H	Preliminary Opinion of Compensability	0Y - 2Q											XXXXX	XXXXX								
22H	Obtain Rights-of-Entry	0Y - 2Q					XXXXX	XXXXX														
22H	Perform Gross Appraisal	0Y - 2Q											XXXXX	XXXXX								
22H	Prepare Real Estate Plan	0Y - 2Q											XXXXX	XXXXX	XXXXX							
22J	Review Existing Dynamics of CSOs	0Y - 2Q				XXXXX	XXXXX															
22J	Review and Modify Existing TNET Models	0Y - 3Q				XXXXX	XXXXX	XXXXX	XXXXX													
22J	Calibrate Existing/Future Without Models	1Y - 0Q						XXXXX	XXXXX	XXXXX	XXXXX											
22J	Develop SWMM Water Quality Model	1Y - 2Q				XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX											
22J	Develop CH3D Hydraulic Model	1Y - 0Q							XXXXX	XXXXX	XXXXX	XXXXX										
22J	Develop GTRAN Sediment Stability Model	1Y - 0Q							XXXXX	XXXXX	XXXXX	XXXXX										
22J	Develop CEQUAL-ICM Water Quality Model	1Y - 0Q							XXXXX	XXXXX	XXXXX	XXXXX										
22J	Run Alternative Models	0Y - 3Q										XXXXX	XXXXX	XXXXX								
22J	Hydraulic Engineering Appendix	0Y - 3Q											XXXXX	XXXXX	XXXXX							
22K	Geotechnical Preliminary Alternative Evaluation	0Y - 3Q									XXXXX	XXXXX	XXXXX									
22K	Geotechnical Field Investigations	1Y - 2Q					XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX										
22K	Slope Stability / Consolidation Analysis	0Y - 2Q									XXXXX	XXXXX										
22K	Geotechnical Appendix	0Y - 3Q											XXXXX	XXXXX	XXXXX							
22L	Phase I HTRW Investigation	0Y - 2Q							XXXXX	XXXXX												
22L	Phase II Sediment and Soil Investigations	0Y - 2Q									XXXXX	XXXXX										
22N	Develop GIS Database	1Y - 0Q					XXXXX	XXXXX	XXXXX	XXXXX												
22N	Utility Mapping	0Y - 2Q							XXXXX	XXXXX												
22N	Real Estate Mapping	0Y - 3Q											XXXXX	XXXXX	XXXXX							
22N	Map Design Features	0Y - 1Q											XXXXX	XXXXX								
22N	3D Display Model	0Y - 1Q													XXXXX							
22P	Preliminary Cost Estimates	0Y - 2Q									XXXXX	XXXXX										
22P	Design Analysis / Drawings	0Y - 3Q									XXXXX	XXXXX	XXXXX									
22P	Final Cost Estimate	0Y - 2Q											XXXXX	XXXXX								
22P	Civil Design Appendix	0Y - 3Q											XXXXX	XXXXX	XXXXX							
22R	Formulation of Alternative Plans	0Y - 3Q								XXXXX	XXXXX	XXXXX										
22R	Evaluation of Alternative Plans	0Y - 3Q										XXXXX	XXXXX	XXXXX								
22R	Determine NER Recommended Plan	0Y - 2Q												XXXXX	XXXXX							
22R	Plan Formulation Appendix	1Y - 1Q									XXXXX	XXXXX	XXXXX	XXXXX	XXXXX							
22S	Feasibility Scoping Meeting (FSM)	0Y - 1Q								XXXXX												
22S	Alternative Formulation Briefing (AFB)	0Y - 1Q												XXXXX								
22S	Final Report Preparation	0Y - 3Q														XXXXX	XXXXX	XXXX				
22S	Independent Technical Reviews (ITR)	1Y - 0Q							XXXXX				XXXXX				XXXXX	XXXX				
22V	Draft Project Cooperation Agreement (PCA)	0Y - 2Q																XXXX	XXXXX			
22V	Draft Preconst. Engineering & Design (PED) Agreement	0Y - 2Q																XXXX	XXXXX			
22Y	Washington Level Review	0Y - 2Q																		XXXXX	XXXXX	
22Z	External Peer Review	0Y - 2Q																XXXX	XXXXX			

ATTACHMENT E

PEER REVIEW PLAN

PEER REVIEW PLAN

BUBBLY CREEK, SOUTH BRANCH OF THE CHICAGO RIVER, ILLINOIS

FEASIBILITY STUDY

Prepared By:

U.S. Army Corps of Engineers
Chicago District

July 2007

BUBBLY CREEK,
SOUTH BRANCH OF THE CHICAGO RIVER
FEASIBILITY STUDY

PEER REVIEW PLAN

July 2007

1. Purpose and Guidance.

A. This document outlines the peer review plan for the Bubbly Creek, South Branch of the Chicago River Feasibility Study. EC 1105-2-408 dated 31 May 2005 "Peer Review of Decision Documents" 1) establishes procedures to ensure the quality and credibility of Corps decision documents by adjusting and supplementing the review process and 2) requires that documents have a peer review plan. The Circular applies to all feasibility studies and reports and any other reports that lead to decision documents that require authorization by Congress. A Feasibility Report (FR) that will potentially lead to Congressional Authorization will be developed and is therefore covered by the Circular.

B. The Circular outlines the requirement of the two review approaches: independent technical review (ITR) and external peer review (EPR), and provides guidance on Corps Planning Centers of Expertise (PCX) involvement in the approaches. This document addresses review of the decision document as it pertains to both approaches and planning coordination with the appropriate Center.

i. ITR. Districts are responsible for ensuring adequate review of the technical aspects of decision documents is accomplished through the ITR approach. ITR is a critical examination by a qualified person or team that was not involved in the day-to-day technical work that supports the decision document. ITR is intended to confirm that such work was done in accordance with clearly established professional principles, practices, codes, and criteria. In addition to technical review, documents should also be reviewed for their compliance with laws and policy. Potential policy issues can be raised during ITR, but ultimate policy determinations are left to the vertical team. The Circular also requires that DrChecks (https://www.projnet.org/projnet/) be used to document all ITR comments, responses, and associated resolution accomplished.

ii. EPR. The Circular added external peer review to the existing Corps review process. This approach does not replace the standard ITR process. The peer review approach applies in special cases where the magnitude and risk of the project are such that a critical examination by a qualified person or team

outside the Corps is necessary. EPR is also used where information is based on novel methods, presents complex interpretation challenges, contains precedent-setting methods or models, or is likely to affect policy decisions that have a significant impact. The degree of independence required for external peer review increases as the project magnitude and project risk increase. Districts along with the PCX are responsible to ensuring adequate review of the technical aspects of the decision documents is accomplished through the EPR approach when warranted.

(a) Projects with low magnitude and low risk may use a routine ITR.

(b) Projects with either high magnitude/low risk or low magnitude/high risk would require both Corps and outside reviewers on the ITR team to address the portions of the project that cause the project to rate high on the magnitude or risk scale.

(c) Projects with high magnitude and high risk require a routine ITR as well as an EPR.

iii. PCX Coordination. The Circular outlines PCX coordination in conjunction with preparation of the review plan. Districts should prepare the plans in coordination with the appropriate PCX. The Corps PCX is responsible for the accomplishment and quality of ITR and EPR for decision documents covered by the Circular. Centers may conduct the review or manage the review to be conducted by others. Reviews will be assigned to the appropriate Center based on business programs. The Circular outlines alternative procedures to apply to decision documents. Each Center is required to post review plans to its website every three months as well as links to any reports that have been made public. The Office of Water Policy Review (OWPR) will consolidate the lists of all review plans and establish a mechanism for soliciting public feedback on the review plans.

2. Project Description.

A. Decision Document. The Feasibility Study will produce a Feasibility Report, accompanied by an environmental document that complies with National Environmental Policy Act (NEPA). This report will provide the basis for a decision by the U.S. Congress to authorize construction of a Federal project. The feasibility phase of this project is cost shared 50/50 with the project sponsor, the City of Chicago. The report will provide planning, engineering, and implementation details of a recommended restoration plan to allow final design and construction to proceed subsequent to the approval of the plan.

B. Study Area. The study area includes the entire 1.25 mile channel and areas draining to the South Fork of the South Branch of the Chicago River, colloquially referred to as "Bubbly Creek" located entirely within the City of Chicago, Cook County, Illinois. A

once sluggishly flowing channel that drained an area of 5 square miles of wetlands has since been severely altered by human development. Bubbly Creek was once a pristine wetland system that provided natural aquatic and terrestrial habitats for fish, bird, and mammal species. Bubbly Creek has endured major physical alterations including deepening and widening of the channel, creation of sheet pile banks, complete filling of wetlands within the original drainage area, severe hydrologic alterations including a major increase in drainage area, and introduction of polluted sediments and runoff. Today, the Bubbly Creek channel drains a 30 square mile area of metropolitan Chicago, begins near Racine Avenue and 38th Street at the Racine Avenue Pumping Station (RAPS), and flows north into the South Branch of the Chicago River near Ashland Avenue.

C. Problems and Opportunities. Bubbly Creek faces a complex series of problems that contribute to severe ecosystem degradation and which must be solved in order to allow for successful ecosystem restoration. Stagnant flow conditions, combined sewer overflows, poor sediment quality and poor water quality all contribute to the degradation of habitat and biological integrity and must be addressed in order to provide sustainable conditions for ecosystem restoration. Successful ecosystem restoration is dependent upon restoring the conditions needed for sustainability. Opportunities include:

- Improve stagnant flow conditions by restoring more natural low flow conditions.
- Reduce extremely high flow velocities during combined sewer overflow events.
- Reduce impacts from combined sewer overflows on water and sediment quality.
- Reduce contaminant migration from existing sediments.
- Improve water quality for aquatic habitat, fish and wildlife, and channel aesthetics.
- Increase or improve riverine and riparian habitats.
- Restore native plant communities within the river corridor.
- Restore wetlands within the river corridor.
- Restore natural stream processes allowing for increased biological integrity.
- Provide ancillary recreational benefits.

D. Product Delivery Team. The product delivery team (PDT) is comprised of individuals from the Chicago District and the City of Chicago directly involved in the development of the decision document. Contact information and disciplines are listed below.

Name	Organization	Discipline
David Bucaro	CELRC-PM-PL-E	Study Manager
CPT Kelsey Lavicka	CELRC-PM-PM	Project Manager
Frank Veraldi	CELRC-PM-PL-E	Fish Biologist
Keith Ryder	CELRC-PM-PL-E	Archeologist

Casey Pittman	CELRC-TS-DH	Environmental Engineer
David Kiel	CELRC-TS-DH	Hydraulic Engineer
Robert Vanoer	CELRC-TS-DC	Civil Engineer
Satch Damaraju	CELRC-TS-DC	Cost Engineer
William Rochford	CELRC-TS-DG	Geotechnical Engineer
Steve Hughes	CELRE-RE	Real Estate Specialist
Ronald Wietecha	CELRC-OC	District Counsel
Renante Marante	City of Chicago Dept. of Environment	Environmental Engineer
Nelson Chueng	City of Chicago Dept. of Planning and Development	City Planner
Cathy Hudzik	City of Chicago Office of the Mayor	Assistant to the Mayor

E. Vertical Team. The Vertical Team includes District management, District Support Team (DST) and Review Integration Team (RIT) staff as well as members of the Planning of Community of Practice (PCoP).

Name	**Organization**	**Discipline**
Gene Fleming	CELRC-PM-PL-E	Chief, Environmental Formulation and Analysis Section
Susanne Davis	CELRC-PM-PL	Chief, Planning Branch
Roy Deda	CELRC-PPPD	Deputy for Project Management
Jan Miller	CELRD-PDS-G	District Liaison
Tab Brown	CELRD-PDS-P	Chief, Planning and Policy
Becky Moyer	CECW-LRD	RIT manager
Lee Ware	CECW-PC	Office of Water Project Review Manager
Rayford Wilbanks	CEMVD-PD-N	ECO-PCX Director
Susan Smith	CEMVD-PD-N	ECO-PCX Deputy Director
David Vigh	CEMVD-RB-T	ECO-PCX Deputy Director

3. ITR Plan.

A. General. As outlined above, the District is responsible for ensuring adequate technical review of decision documents. The responsible PDT District of this decision document is Chicago District (LRC). An ITR Manager shall be designated for the ITR process. At this time, the ITR team has not been selected for this study. The ITR Manager is responsible for providing information necessary for setting up the review,

communicating with the Study Manager, providing a summary of critical review comments, collecting grammatical and editorial comments from the ITR team (ITRT), ensuring that the ITRT has adequate funding to perform the review, facilitating the resolution of the comments, and certifying that the ITR has been conducted and resolved in accordance with policy.

B. ITR Team. The ITRT will be comprised of individuals that have not been involved in the development of the decision document and will be chosen based on expertise, experience, and/or skills. The members of the ITRT will roughly mirror the composition of the PDT. The areas of expertise for the ITRT members are:

Name	Organization	Title
TBD	TBD	Regional Technical Specialist, Plan Formulation; Lead for ITR
TBD	TBD	Biologist
TBD	TBD	Environmental Engineer
TBD	TBD	Hydraulic Engineer
TBD	TBD	Geotechnical Engineer
TBD	TBD	Cost Engineer
TBD	TBD	Realty Specialist

C. ITR Process. The process for completing the ITR is laid out as follows:

i. The Study Manager will coordinate with the PDT to provide draft versions of reviewable products in electronic format to ITRT members. Hard copies can be provided to the ITRT upon request.

ii. Members of the ITR team will provide comments using DrChecks. Comments will reference laws, policy, guidance, engineering manuals, professional principles, practices, codes, and criteria. Reviewers will also suggest action to be taken by PDT for resolution. Open ended comments without specific references are discouraged. Comments will be provided within an agreed upon timeframe laid out below.

iii. The PDT will review comments, incorporate changes, and formally respond to comments citing edits in revised documents. Conference calls will be used to resolve any conflicting comments and responses. A revised electronic version of the report and appendices with comments incorporated will be made available to the ITRT during back checking of the comments.

iv. Members of the ITR team will backcheck responses to ensure comments were adequately addressed. Fully resolved comments will be closed out. Reviewers may "agree to disagree" with any comment response and close the comment with a detailed explanation. In the event that a comment can not be

resolved, reasons for the impasse will be documented DrChecks and the issue will be elevated up through the vertical team. All efforts shall be made to come to an agreeable solution prior to elevating the issue. ITRT members shall keep the ITR manager apprised of problematic comments. The vertical team will be informed of any policy variations or other issues that may cause concern during the Feasibility Scoping Meeting (FSM), Alternative Formulation Briefing (AFB) or any Issue Resolution Conferences (IRCs).

D. Funding. Cost-shared feasibility study funds will be used to perform the ITR.

i. The Chicago District will setup and provided labor funding for members of the ITRT. The Study Manager will work with the ITR manager to ensure that adequate funding is available and is commensurate with the level of review needed. A total of $26,000 has been budgeted for the ITR of the feasibility study products.

E. Timing and Schedule. Draft schedule for ITR is laid out below:

i. A minimum of three ITR reviews have been scheduled during the feasibility study. Additional ITR review of individual products could be added during the development of the feasibility study. Early coordination with the ITRT will be done to ensure availability of ITRT members. The team will normally be given two weeks time for review.

ii. The ITR schedule foreseen at this point is shown in the timeline below.

ITR Product	**Review Schedule**
Feasibility Scoping Meeting (FSM) Documentation	3rd Quarter – FY2008
Alternative Formulation Briefing (AFB) Documentation	3rd Quarter – FY2009
Draft Final Feasibility Report & NEPA Document	3rd Quarter – FY2010

F. Certification. To fully document the ITR process, a statement of technical review will be prepared and signed by all ITR reviewers once issues raised by the reviewers are addressed to the review team's satisfaction. Indication of this concurrence will be documented by the signing of a certification statement, which is attached to draft final report Quality Control Review Report (QCRR). A summary report of all comments and responses will follow the statement and accompany the report throughout the report approval process as part of the QCRR.

4. EPR Plan.

A. General. The decision as whether or not a decision document requires an external peer review is based upon the level of project magnitude and risk. A decision is made to perform an EPR by vertical team consensus (involving district, major subordinate command and Headquarters members) when the covered subject matter is novel, is

controversial, is precedent setting, has significant interagency interest, or has significant economic, environmental, and social effects to the nation. Once the decision is made to perform an EPR on a decision document is made, an EPR Manager shall be designated from the respective PCX to manage the EPR process. At this time the decision as to whether or not an EPR will be performed on this study has not been made. The feasibility study has not commenced and information needed to determine whether or not an EPR is necessary is not available at this point. However, for the development of the Project Management Plan it was assumed that an EPR would be necessary.

B. Funding. Cost-shared feasibility study funds will be used to perform the EPR if one is necessary.

i. The Chicago District will provide funding to the PCX to manage the EPR. The Study Manager will work with the EPR manager to ensure that adequate funding is available and is commensurate with the level of review needed. A total of $50,000 has been budgeted for an EPR of the feasibility study products if needed.

C. Timing and Schedule. Draft schedule for the EPR if one is necessary is laid out below:

i. One EPR review has been scheduled during the feasibility study. Additional EPR review of individual products could be added during the development of the feasibility study. Early coordination with the PCX will be done to ensure availability of EPR members. The EPR team will normally be given one month for review.

ii. An EPR on the Draft Final Feasibility Report and NEPA Document would begin during the final ITR review after comments are received. Major ITR comments will be addressed prior to commencing the EPR. The schedule foreseen at this point is 4th Quarter – FY2010.

5. Public and Agency Review. Public and agency review of the Draft Final Feasibility Report and NEPA Document will occur simultaneously with the EPR if one is necessary. If an EPR is not necessary, the schedule for public and agency review will be the same. A public scoping meeting will be held upfront in the study process to help establish project goals and opportunities. A second public scoping meeting is to be held during the public review period of the draft report and NEPA document to elicit additional comments. Public comments on review of the draft report and NEPA document and at any public meetings held during the planning process will be included in the Final Report and will be made available to the review team.

6. PCX Coordination. The appropriate PCX for this document is the National Ecosystem Planning Center of Expertise located within MVD. This review plan will be submitted through the PDT District (LRC) Planning Chief, to the PCX Director, Rayford Wilbanks,

and PCX Deputies, Dr. David Vigh and Susan Smith, for coordination and approval. The PCX will be engaged throughout the feasibility study process. Once enough necessary information is gathered to decide whether an EPR is needed, the PCX will help facilitate the decision process through the vertical team. Once the PRP is finalized and approved, the approved review plan will be posted to the PCX website.

7. Approvals. The PDT will carry out the review plan as described. The Study Manager will submit the plan to the PDT District Planning Chief for approval. Coordination with PCX will occur through the PDT District Planning Chief. Signatures by the individuals below indicate approval of the plan as proposed.

_____ Date

DAVID F. BUCARO
Study Manager
Chicago District

_____ Date

SUSANNE J. DAVIS
Chief, Planning Branch
Chicago District

_____ Date

ROY J. DEDA
Deputy for Project Management
Chicago District

_____ Date

THEODORE A. BROWN
Chief, Planning and Policy Division
Great Lakes and Ohio River Division

AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE CITY OF CHICAGO
FOR THE
SOUTH BRANCH OF THE CHICAGO RIVER
FEASIBILITY STUDY

THIS AGREEMENT is entered into this 16th day of August, 2007, by and between the Department of the Army (hereinafter the "Government"), represented by the US Army Engineer, Chicago District and the City of Chicago (hereinafter the "Non-Federal Sponsor"), represented by its Mayor.

WITNESSETH, THAT:

WHEREAS, by resolution dated July 20, 2005, the Committee on Environment and Public Works, U.S. Senate has requested a review of the report of the Chief of Engineers on the Illinois River, Illinois with a view to determining whether any modifications to the South Fork of the South Branch of the Chicago River (commonly known as Bubbly Creek) for ecosystem restoration is advisable;

WHEREAS, the U.S. Army Corps of Engineers conducted a reconnaissance study of ecosystem restoration pursuant to such request and determined that further planning in the nature of a feasibility study for ecosystem restoration should proceed;

WHEREAS, the Government and the Non-Federal Sponsor desire to enter into an agreement (hereinafter the "Agreement") to conduct such feasibility study (hereinafter the "*Study*" as defined in Article I.A. of this Agreement);

WHEREAS, Section 105(a) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2215(a)), specifies the cost-sharing requirements applicable to the *Study*;

WHEREAS, the Non-Federal Sponsor desires to provide in-kind contributions (hereinafter the "*non-Federal in-kind contributions*" as defined in Article I.K. of this Agreement) that are necessary to prepare the feasibility report and to receive credit for such contributions toward the amount of its required contribution for the *Study*;

WHEREAS, the Non-Federal Sponsor may provide up to 100 percent of its required contribution for the *Study* as *non-Federal in-kind contributions*;

WHEREAS, the Government and Non-Federal Sponsor have the full authority and capability to perform as hereinafter set forth and intend to cooperate in cost-sharing and financing of the *Study* in accordance with the terms of this Agreement; and

WHEREAS, the Government and the Non-Federal Sponsor, in connection with this Agreement, desire to foster a partnering strategy and a working relationship between the Government and the Non-Federal Sponsor through a mutually developed formal strategy of commitment and communication embodied herein, which creates an environment where trust and teamwork prevent disputes, foster a cooperative bond between the Government and the Non-Federal Sponsor, and facilitate the successful *Study*.

NOW, THEREFORE, the Government and the Non-Federal Sponsor agree as follows:

ARTICLE I – DEFINITIONS

A. The term "*Study*" shall mean the activities and tasks required to identify and evaluate alternatives and the preparation of a decision document that, when appropriate, recommends a coordinated and implementable solution for ecosystem restoration at Chicago, Illinois, as generally described in the 905(b) Report, approved by Commander, Great Lakes and Ohio River Division on April 20, 2007. The term includes the *non-Federal in-kind contributions* described in paragraph K. of this Article.

B. The term "*total study costs*" shall mean the sum of all costs incurred by the Non-Federal Sponsor and the Government in accordance with the terms of this Agreement directly related to performance of the *Study*. Subject to the provisions of this Agreement, the term shall include, but is not necessarily limited to: the Government's costs of plan formulation and evaluation, including applicable economic, engineering, real estate, and environmental analyses; the Government's costs of preparation of the decision document for the *Study*; the costs of the *non-Federal in-kind contributions* determined in accordance with Article II.E. of this Agreement; the Government's costs of independent technical review and other review processes required by the Government; the Government's costs of external peer review, if required; the Government's supervision and administration costs; the Non-Federal Sponsor's and the Government's costs of participation in the Study Coordination Team in accordance with Article III of this Agreement; the Government's costs of contract dispute settlements or awards; and the Non-Federal Sponsor's and the Government's costs of audit in accordance with Article VI.B. and Article VI.C. of this Agreement. The term does not include any costs of dispute resolution under Article V of this Agreement; any costs incurred as part of reconnaissance studies; any costs incurred as part of feasibility studies under any other agreement; the Non-Federal Sponsor's costs of negotiating this Agreement; or any costs of negotiating a design agreement for a project or separable element thereof.

C. The term "*study costs to be shared during the period of study*" shall mean the difference between *total study costs* and *excess study costs*.

D. The term "*excess study costs*" shall mean the difference between the most recent estimate of *total study costs* and the amount of *total study costs* specified in Article IV.A.1. of this Agreement, excluding any increase in *total study costs* that resulted from a change in Federal

law or a change in the scope of the *Study* requested by the Non-Federal Sponsor or any increase in *total study costs* that otherwise was agreed upon in writing by the parties.

E. The term "*period of study*" shall mean the time from the effective date of this Agreement to the date that:

1. the Assistant Secretary of the Army (Civil Works) submits the feasibility report to the Office of Management and Budget (OMB) for review for consistency with policies and programs of the Administration, if the project or project modification that is the subject of this *Study* will require further Congressional authorization to implement the recommended plan; or

2. the decision document for the study is duly approved by the Government, if the project or project modification that is the subject of this *Study* will not require further Congressional authorization to implement the recommended plan; or

3. the date that this Agreement is terminated in accordance with Article IX of this Agreement.

F. The term "*financial obligations to be shared during the period of study*" shall mean the financial obligations of the Government and the costs for the *non-Federal in-kind contributions*, as determined by the Government, that result or would result in costs that are or would be included in *study costs to be shared during the period of study.*

G. The term "*non-Federal proportionate share*" shall mean the ratio of the sum of the costs included in *study costs to be shared during the period of study* for the *non-Federal in-kind contributions*, as determined by the Government, and the Non-Federal Sponsor's total contribution of funds required by Article II.C.1.b. of this Agreement to *financial obligations to be shared during the period of study*, as projected by the Government.

H. The term "*Federal program funds*" shall mean funds provided by a Federal agency, other than the Department of the Army, plus any non-Federal contribution required as a matching share therefor.

I. The term "*fiscal year*" shall mean one year beginning on October 1 and ending on September 30.

J. The term "*PMP*" shall mean the project management plan, and any modifications thereto, developed by the Government, and agreed to by the Non-Federal Sponsor, that specifies the scope, cost, and schedule for *Study* activities and guides the performance of the *Study* through the *period of study*.

K. The term "*non-Federal in-kind contributions*" shall mean planning, supervision and administration, services, materials, supplies, and other in-kind services that are performed or

provided by the Non-Federal Sponsor after the effective date of this Agreement in accordance with the *PMP* and that are necessary for performance of the *Study*.

L. The term "*fiscal year of the Non-Federal Sponsor*" shall mean one year beginning on January 1 and ending on December 31

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND THE NON-FEDERAL SPONSOR

A. The Government, subject to receiving funds appropriated by the Congress of the United States (hereinafter the "Congress") and using those funds and funds provided by the Non-Federal Sponsor, expeditiously shall conduct the *Study*, applying those procedures usually applied to Federal projects, in accordance with Federal laws, regulations, and policies. The Non-Federal Sponsor expeditiously shall perform or provide the *non-Federal in-kind contributions* in accordance with applicable Federal laws, regulations, and policies.

1. The Government shall not issue the solicitation for the first contract for the *Study* or commence the *Study* using the Government's own forces until the Non-Federal Sponsor has confirmed in writing its willingness to proceed with the *Study*.

2. To the extent possible, the Government and the Non-Federal Sponsor shall conduct the *Study* in accordance with the *PMP*.

3. The Government shall afford the Non-Federal Sponsor the opportunity to review and comment on all products that are developed by contract or by Government personnel during the *period of study*. The Government shall consider in good faith the comments of the Non-Federal Sponsor, but the final approval of all *Study* products shall be exclusively within the control of the Government.

4. The Government shall afford the Non-Federal Sponsor the opportunity to review and comment on the solicitations for all Government contracts, including relevant scopes of work, prior to the Government's issuance of such solicitations. To the extent possible, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on all proposed contract modifications, including change orders. In any instance where providing the Non-Federal Sponsor with notification of a contract modification is not possible prior to execution of the contract modification, the Government shall provide such notification in writing at the earliest date possible. To the extent possible, the Government also shall afford the Non-Federal Sponsor the opportunity to review and comment on all contract claims prior to resolution thereof. The Government shall consider in good faith the comments of the Non-Federal Sponsor, but the contents of solicitations, award of contracts or commencement of work on the *Study* using the Government's own forces, execution of contract modifications, resolution of contract claims, and performance of all work on the *Study*, except for the *non-Federal in-kind contributions*, shall be exclusively within the control of the Government.

5. At the time the U.S. Army Engineer, Chicago District (hereinafter the "District Engineer") furnishes the contractor with the Government's Written Notice of Acceptance of Completed Work for each contract awarded by the Government for the *Study*, the District Engineer shall furnish a copy thereof to the Non-Federal Sponsor.

6. The Non-Federal Sponsor shall afford the Government the opportunity to review and comment on the solicitations for all contracts for the *non-Federal in-kind contributions*, including relevant scopes of work, prior to the Non-Federal Sponsor's issuance of such solicitations. To the extent possible, the Non-Federal Sponsor shall afford the Government the opportunity to review and comment on all proposed contract modifications, including change orders. In any instance where providing the Government with notification of a contract modification is not possible prior to execution of the contract modification, the Non-Federal Sponsor shall provide such notification in writing at the earliest date possible. To the extent possible, the Non-Federal Sponsor also shall afford the Government the opportunity to review and comment on all contract claims prior to resolution thereof. The Non-Federal Sponsor shall consider in good faith the comments of the Government but the contents of solicitations, award of contracts or commencement of work on the *Study* using the Non-Federal Sponsor's own forces, execution of contract modifications, resolution of contract claims, and performance of all work on the *non-Federal in-kind contributions* shall be exclusively within the control of the Non-Federal Sponsor.

7. At the time the Non-Federal Sponsor furnishes a contractor with a notice of acceptance of completed work for each contract awarded by the Non-Federal Sponsor for the *non-Federal in-kind contributions*, the Non-Federal Sponsor shall furnish a copy thereof to the Government.

8. Notwithstanding paragraph A.4. and paragraph A.6., if the award of any contract for work on the *Study*, or continuation of work on the *Study* using the Government's or the Non-Federal Sponsor's own forces, would result in *excess study costs*, the Government and the Non-Federal Sponsor agree to defer award of that contract, award of all remaining contracts for work on the *Study*, and continuation of work on the *Study* using the Government's or the Non-Federal Sponsor's own forces until such time as the Government and the Non-Federal Sponsor agree in writing to proceed with further contract awards for the *Study* or the continuation of work on the *Study* using the Government's or the Non-Federal Sponsor's own forces, but in no event shall the award of contracts or the continuation of work on the *Study* using the Government's or the Non-Federal Sponsor's own forces be deferred for more than six months. If the Government and the Non-Federal Sponsor agree to not proceed or fail to reach agreement on proceeding with further contract awards for the *Study*, or the continuation of work on the *Study* using the Government's or the Non-Federal Sponsor's own forces, the parties shall terminate this Agreement and proceed in accordance with Article IX.D. of this Agreement.

9. As of the effective date of this Agreement, $2,000,000 of Federal funds is currently projected to be available for the *Study*. The Government makes no commitment to

request Congress to provide additional Federal funds for the *Study*. Further, the Government's financial participation in the *Study* is limited to the Federal funds that the Government makes available to the *Study*.

B. The Government shall allocate *total study costs* between *study costs to be shared during the period of study* and *excess study costs*.

C. The Non-Federal Sponsor shall contribute 50 percent of *study costs to be shared during the period of study* in accordance with the provisions of this paragraph.

1. The Non-Federal Sponsor shall provide a contribution of funds as determined below:

a. If the Government projects at any time that the collective value of the Non-Federal Sponsor's contributions under Article III and Article VI of this Agreement will be less than the Non-Federal Sponsor's required share of 50 percent of *study costs to be shared during the period of study*, the Government shall determine the amount of funds that would be necessary to meet the Non-Federal Sponsor's required share prior to any consideration of the credit the Government projects will be afforded for the *non-Federal in-kind contributions* pursuant to paragraph F. of this Article.

b. The Non-Federal Sponsor shall provide funds in the amount determined by this paragraph in accordance with Article IV.B. of this Agreement. To determine the contribution of funds the Non-Federal Sponsor shall provide, the Government shall reduce the amount determined in accordance with paragraph C.1.a. of this Article by the amount of credit the Government projects will be afforded for the *non-Federal in-kind contributions* pursuant to paragraph F. of this Article.

2. The Government, subject to the availability of funds and as limited by paragraph G. of this Article, shall refund or reimburse to the Non-Federal Sponsor any contributions in excess of 50 percent of *study costs to be shared during the period of study* if the Government determines at any time that the collective value of the following contributions has exceeded 50 percent of *study costs to be shared during the period of study*: (a) the value of the Non-Federal Sponsor's contributions under paragraph C.1.b. of this Article; (b) the amount of credit to be afforded for the *non-Federal in-kind contributions* pursuant to paragraph F. of this Article; and (c) the value of the Non-Federal Sponsor's contributions under Article III and Article VI of this Agreement.

D. The Non-Federal Sponsor shall contribute 50 percent of *excess study costs* in accordance with the provisions of this paragraph.

1. The Government shall determine the amount of funds that would be necessary to meet the Non-Federal Sponsor's required share prior to any consideration of the credit the Government projects will be afforded for the *non-Federal in-kind contributions* pursuant to paragraph F. of this Article.

2. The Non-Federal Sponsor shall provide funds in the amount determined by this paragraph in accordance with Article IV.C.3. of this Agreement. To determine the contribution of funds the Non-Federal Sponsor shall provide, the Government shall reduce the amount determined in accordance with paragraph D.1. of this Article by the amount of credit the Government projects will be afforded for the *non-Federal in-kind contributions* pursuant to paragraph F. of this Article.

E. The Government shall determine and include in *total study costs* any costs incurred by the Non-Federal Sponsor for *non-Federal in-kind contributions*, subject to the conditions and limitations of this paragraph. The Non-Federal Sponsor in a timely manner shall provide the Government with such documents as are sufficient to enable the Government to determine the amount of costs to be included in *total study costs* for *non-Federal in-kind contributions*.

1. Acceptance by the Government of *non-Federal in-kind contributions* shall be subject to a review by the Government to verify that all economic, engineering, real estate, and environmental analyses or other items performed or provided as *non-Federal in-kind contributions* are accomplished in a satisfactory manner and in accordance with applicable Federal laws, regulations, and policies, and to verify that all analyses, services, materials, supplies, and other in-kind services provided as *non-Federal in-kind contributions* are necessary for the *Study*.

2. The Non-Federal Sponsor's costs for *non-Federal in-kind contributions* that may be eligible for inclusion in *total study costs* pursuant to this Agreement shall be subject to an audit in accordance with Article VI.C. of this Agreement to determine the reasonableness, allocability, and allowability of such costs.

3. The Non-Federal Sponsor's costs for *non-Federal in-kind contributions* that may be eligible for inclusion in *total study costs* pursuant to this Agreement are not subject to interest charges, nor are they subject to adjustment to reflect changes in price levels between the time the *non-Federal in-kind contributions* are provided and the time the costs are included in *total study costs*.

4. The Government shall not include in *total study costs* any costs for *non-Federal in-kind contributions* paid by the Non-Federal Sponsor using *Federal program funds* unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is expressly authorized by Federal law.

5. The Government shall not include in *total study costs* any costs for *non-Federal in-kind contributions* in excess of the Government's estimate of the costs of the *non-Federal in-kind contributions* if the services, materials, supplies, and other in-kind services had been provided by the Government.

F. The Government, in accordance with this paragraph, shall afford credit toward the

amount of funds determined in accordance with paragraph C.1.a. and paragraph D.1. of this Article for the costs of the *non-Federal in-kind contributions* determined in accordance with paragraph E. of this Article. The credit for *non-Federal in-kind contributions* first shall be afforded toward the amount of funds determined in accordance with paragraph C.1.a. of this Article. If the amount of credit afforded exceeds the amount of funds determined in accordance with paragraph C.1.a. of this Article, the remaining portion of credit to be afforded shall be afforded toward the amount of funds determined in accordance with paragraph D.1. of this Article. However, the maximum amount of credit that can be afforded for the *non-Federal in-kind contributions* shall not exceed the least of the following amounts as determined by the Government: the amount of funds determined in accordance with paragraph C.1.a. and paragraph D.1. of this Article; the costs of the *non-Federal in-kind contributions* determined in accordance with paragraph E. of this Article; or 50 percent of *total study costs*.

G. Notwithstanding any other provision of this Agreement, the Non-Federal Sponsor shall not be entitled to reimbursement of any costs of *non-Federal in-kind contributions* determined in accordance with paragraph E. of this Article and included in *total study costs* that exceed the amount of credit afforded for the *non-Federal in-kind contributions* determined in accordance with paragraph F. of this Article and the Non-Federal Sponsor shall be responsible for 100 percent of all costs of *non-Federal in-kind contributions* included in *total study costs* that exceed the amount of credit afforded.

H. Upon conclusion of the *period of study*, the Government shall conduct an accounting, in accordance with Article IV.C. of this Agreement, and furnish the results to the Non-Federal Sponsor.

I. The Non-Federal Sponsor shall not use *Federal program funds* to meet any of its obligations for the *Study* under this Agreement unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is expressly authorized by Federal law.

J. This Agreement shall not be construed as obligating either party to implement a project. Whether the Government supports a project authorization, if authorization is required, and budgets for implementation of the project depends upon, among other things, the outcome of the *Study* and whether the proposed solution is consistent with the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies and with the budget priorities of the Administration.

ARTICLE III - STUDY COORDINATION TEAM

A. To provide for consistent and effective communication, the Non-Federal Sponsor and the Government, not later than 30 calendar days after the effective date of this Agreement, shall appoint named senior representatives to a Study Coordination Team. Thereafter, the Study Coordination Team shall meet regularly until the end of the *period of study*. The Government's Project Manager and a counterpart named by the Non-Federal Sponsor shall co-chair the Study Coordination Team.

B. The Government's Project Manager and the Non-Federal Sponsor's counterpart shall keep the Study Coordination Team informed of the progress of the *Study* and of significant pending issues and actions, and shall seek the views of the Study Coordination Team on matters that the Study Coordination Team generally oversees.

C. Until the end of the *period of study*, the Study Coordination Team shall generally oversee the *Study*, including matters related to: plan formulation and evaluation, including applicable economic, engineering, real estate, and environmental analyses; scheduling of reports and work products; independent technical review and other review processes required by the Government; external peer review, if required; completion of all necessary environmental coordination and documentation; contract awards and modifications; contract costs; the Government's cost projections; the performance of and scheduling for the *non-Federal in-kind contributions*; determination of anticipated future requirements for real property and relocation requirements and performance of operation, maintenance, repair, rehabilitation, and replacement of the proposed project including anticipated requirements for permits; and other matters related to the *Study*. This oversight of the *Study* shall be consistent with the *PMP*.

D. The Study Coordination Team may make recommendations to the District Engineer on matters related to the *Study* that the Study Coordination Team generally oversees, including suggestions to avoid potential sources of dispute. The Government in good faith shall consider the recommendations of the Study Coordination Team. The Government, having the legal authority and responsibility for performance of the *Study* except for the *non-Federal in-kind contributions*, has the discretion to accept or reject, in whole or in part, the Study Coordination Team's recommendations. On matters related to the *non-Federal in-kind contributions*, that the Study Coordination Team generally oversees, the Study Coordination Team may make recommendations to the Non-Federal Sponsor including suggestions to avoid potential sources of dispute. The Non-Federal Sponsor in good faith shall consider the recommendations of the Study Coordination Team. The Non-Federal Sponsor, having the legal authority and responsibility for the *non-Federal in-kind contributions*, has the discretion to accept or reject, in whole or in part, the Study Coordination Team's recommendations except as otherwise required by the provisions of this Agreement, including compliance with applicable Federal, State, or local laws or regulations.

E. The Non-Federal Sponsor's costs of participation in the Study Coordination Team shall be included in *total study costs* and shared in accordance with the provisions of this Agreement, subject to an audit in accordance with Article VI.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs. The Government's costs of participation in the Study Coordination Team shall be included in *total study costs* and shared in accordance with the provisions of this Agreement.

ARTICLE IV - METHOD OF PAYMENT

A. In accordance with the provisions of this paragraph, the Government shall maintain

current records and provide to the Non-Federal Sponsor current projections of costs, financial obligations, the contributions provided by the parties, the costs included in *total study costs* for the *non-Federal in-kind contributions* determined in accordance with Article II.E. of this Agreement, and the credit to be afforded for the *non-Federal in-kind contributions* pursuant to Article II.F. of this Agreement.

1. As of the effective date of this Agreement, *total study costs* are projected to be $2,650,000; the amount of funds determined in accordance with Article II.C.1.a. of this Agreement is projected to be $1,325,000; the costs included in *total study costs* for the *non-Federal in-kind contributions* determined in accordance with Article II.E. of this Agreement are projected to be $641,100; the credit to be afforded for the *non-Federal in-kind contributions* pursuant to Article II.F. of this Agreement is projected to be $641,100; the Non-Federal Sponsor's contribution of funds required by Article II.C.1.b. of this Agreement is projected to be $683,900; and the *non-Federal proportionate share* is projected to be 50.00 percent. These amounts and percentage are estimates subject to adjustment by the Government, after consultation with the Non-Federal Sponsor, and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

2. By _____ and by each quarterly anniversary thereof until the conclusion of the *period of study* and resolution of all relevant claims and appeals, the Government shall provide the Non-Federal Sponsor with a report setting forth all contributions provided to date and the current projections of the following: *total study costs*; *study costs to be shared during the period of study*; the amount of funds determined in accordance with Article II.C.1.a. of this Agreement; the Non-Federal Sponsor's contribution of funds required by Article II.C.1.b. of this Agreement; *excess study costs*; the amount of funds determined in accordance with Article II.D.1. of this Agreement; the Non-Federal Sponsor's contribution of funds required by Article II.D.2. of this Agreement; the costs included in *total study costs* for the *non-Federal in-kind contributions* determined in accordance with Article II.E. of this Agreement; the credit to be afforded for the *non-Federal in-kind contributions* pursuant to Article II.F. of this Agreement; the total contribution of funds required from the Non-Federal Sponsor for the upcoming contract and upcoming *fiscal year*; and the *non-Federal proportionate share*.

B. The Non-Federal Sponsor shall provide the contribution of funds required by Article II.C.1.b. of this Agreement in accordance with the provisions of this paragraph.

1. Not less than 30 calendar days prior to the scheduled date for issuance of the solicitation for the first contract for work on the *Study* or commencement of work on the *Study* using the Government's own forces, the Government shall notify the Non-Federal Sponsor in writing of such scheduled date and the funds the Government determines to be required from the Non-Federal Sponsor to meet: (a) the *non-Federal proportionate share* of *financial obligations to be shared during the period of study* incurred prior to the commencement of the *period of study*; (b) the projected *non-Federal proportionate share* of *financial obligations to be shared during the period of study* to be incurred for such contract; and (c) the projected *non-Federal proportionate share* of *financial obligations to be shared during the period of study* using the

Government's own forces through the first *fiscal year of the Non-Federal Sponsor*. Not later than such scheduled date, the Non-Federal Sponsor shall provide the Government with the full amount of such required funds by delivering a check payable to "FAO, USAED, Chicago" to the District Engineer, or verifying to the satisfaction of the Government that the Non-Federal Sponsor has deposited such required funds in an escrow or other account acceptable to the Government, with interest accruing to the Non-Federal Sponsor, or by presenting the Government with an irrevocable letter of credit acceptable to the Government for such required funds, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government.

2. Thereafter, until the work on the *Study* is complete, the Government shall notify the Non-Federal Sponsor in writing of the funds the Government determines to be required from the Non-Federal Sponsor, and the Non-Federal Sponsor shall provide such funds in accordance with the provisions of this paragraph.

a. The Government shall notify the Non-Federal Sponsor in writing, no later than 60 calendar days prior to the scheduled date for issuance of the solicitation for each remaining contract for work on the *Study*, of the funds the Government determines to be required from the Non-Federal Sponsor to meet the projected *non-Federal proportionate share* of *financial obligations to be shared during the period of study* to be incurred for such contract. No later than such scheduled date, the Non-Federal Sponsor shall make the full amount of such required funds available to the Government through any of the payment mechanisms specified in paragraph B.1. of this Article.

b. The Government shall notify the Non-Federal Sponsor in writing, no later than 60 calendar days prior to the beginning of each *fiscal year of the Non-Federal Sponsor* in which the Government projects that it will make *financial obligations to be shared during the period of study* using the Government's own forces, of the funds the Government determines to be required from the Non-Federal Sponsor to meet the projected *non-Federal proportionate share* of *financial obligations to be shared during the period of study* using the Government's own forces for that *fiscal year of the Non-Federal Sponsor*. No later than 30 calendar days prior to the beginning of that *fiscal year of the Non-Federal Sponsor*, the Non-Federal Sponsor shall make the full amount of such required funds for that *fiscal year of the Non-Federal Sponsor* available to the Government through any of the payment mechanisms specified in paragraph B.1. of this Article.

3. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary, when considered with any credit the Government projects will be afforded for the *non-Federal in-kind contributions* pursuant to Article II.F. of this Agreement, to cover: (a) the *non-Federal proportionate share* of *financial obligations to be shared during the period of study* incurred prior to the commencement of the *period of study*; and (b) the *non-Federal proportionate share* of *financial obligations to be shared during the period of study* as *financial obligations to be shared during the period of study* are incurred. If at any time the Government determines that additional funds will be needed

from the Non-Federal Sponsor to cover the Non-Federal Sponsor's share of such financial obligations for the current contract or to cover the Non-Federal Sponsor's share of such financial obligations for work performed using the Government's own forces in the current *fiscal year of the Non-Federal Sponsor*, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required and provide an explanation of why additional funds are required. Within 60 calendar days from receipt of such notice, the Non-Federal Sponsor shall provide the Government with the full amount of such additional required funds through any of the payment mechanisms specified in paragraph B.1. of this Article.

C. Upon conclusion of the *period of study* and resolution of all relevant claims and appeals, the Government shall conduct a final accounting and furnish the Non-Federal Sponsor with written notice of the results of such final accounting. If outstanding relevant claims and appeals prevent a final accounting from being conducted in a timely manner, the Government shall conduct an interim accounting and furnish the Non-Federal Sponsor with written notice of the results of such interim accounting. Once all outstanding relevant claims and appeals are resolved, the Government shall amend the interim accounting to complete the final accounting and furnish the Non-Federal Sponsor with written notice of the results of such final accounting. The interim or final accounting, as applicable, shall determine *total study costs*, *study costs to be shared during the period of study*, and *excess study costs*. In addition, the interim or final accounting, as applicable, shall determine each party's required share thereof, and each party's total contributions thereto as of the date of such accounting.

1. Should the interim or final accounting, as applicable, show that the Non-Federal Sponsor's total required share of *study costs to be shared during the period of study* exceeds the Non-Federal Sponsor's total contributions provided thereto, the Non-Federal Sponsor, no later than 90 calendar days after receipt of written notice from the Government, shall make a payment to the Government in an amount equal to the difference by delivering a check payable to "FAO, USAED, Chicago" to the District Engineer or by providing an Electronic Funds Transfer in accordance with procedures established by the Government.

2. Should the interim or final accounting, as applicable, show that the total contributions provided by the Non-Federal Sponsor for *study costs to be shared during the period of study* exceed the Non-Federal Sponsor's total required share thereof, the Government, subject to the availability of funds and as limited by Article II.G. of this Agreement, shall refund or reimburse the excess amount to the Non-Federal Sponsor within 90 calendar days of the date of completion of such accounting. In the event the Non-Federal Sponsor is due a refund or reimbursement and funds are not available to refund or reimburse the excess amount to the Non-Federal Sponsor, the Government shall seek such appropriations as are necessary to make the refund or reimbursement.

3. Should the final accounting show that the Non-Federal Sponsor's total required share of *excess study costs* exceeds the Non-Federal Sponsor's total contributions provided thereto the Non-Federal Sponsor, within the applicable time frame described below, shall make a payment to the Government in an amount equal to the difference by delivering a

check payable to "FAO, USAED, Chicago" to the District Engineer or by providing an Electronic Funds Transfer in accordance with procedures established by the Government.

a. If the project or project modification that is the subject of this *Study* will require further Congressional authorization to implement the recommended plan and:

i. the project or project modification is authorized for construction – then the payment shall be made no later than the date on which a Project Cooperation Agreement is entered into for the project or project modification; or

ii. the project or project modification is not authorized for construction within 5 years after the date of the final Report of the Chief of Engineers concerning the project or project modification – then the payment shall be made no later than 5 years after the date of the final Report of the Chief of Engineers; or

iii. the *Study* is terminated and the project or project modification is not authorized for construction - then the payment shall be made no later than 2 years after such termination date.

b. If the project or project modification that is the subject of this *Study* will not require further Congressional authorization to implement the recommended plan, then the payment shall be made:

i. no later than the date on which a Project Cooperation Agreement is entered into for the project or project modification; or

ii. no later than 5 years after the date the decision document is duly approved by the Government; or

iii. no later than 2 years after the date of the termination of the *Study*, whichever is earliest.

ARTICLE V - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to both parties. Each party shall pay an equal share of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VI - MAINTENANCE OF RECORDS AND AUDIT

A. Not later than 60 calendar days after the effective date of this Agreement, the Government and the Non-Federal Sponsor shall develop procedures for keeping books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to this Agreement. These procedures shall incorporate, and apply as appropriate, the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 C.F.R. Section 33.20. The Government and the Non-Federal Sponsor shall maintain such books, records, documents, or other evidence in accordance with these procedures and for a minimum of three years after completion of the accounting for which such books, records, documents, or other evidence were required. To the extent permitted under applicable Federal laws and regulations, the Government and the Non-Federal Sponsor shall each allow the other to inspect such books, records, documents, or other evidence.

B. In accordance with 32 C.F.R. Section 33.26, the Non-Federal Sponsor is responsible for complying with the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507), as implemented by OMB Circular No. A-133 and Department of Defense Directive 7600.10. Upon request of the Non-Federal Sponsor and to the extent permitted under applicable Federal laws and regulations, the Government shall provide to the Non-Federal Sponsor and independent auditors any information necessary to enable an audit of the Non-Federal Sponsor's activities under this Agreement. The costs of any non-Federal audits performed in accordance with this paragraph shall be allocated in accordance with the provisions of OMB Circulars A-87 and A-133, and such costs as are allocated to the *Study* shall be included in *total study costs* and shared in accordance with the provisions of this Agreement.

C. In accordance with 31 U.S.C. 7503, the Government may conduct audits in addition to any audit that the Non-Federal Sponsor is required to conduct under the Single Audit Act Amendments of 1996. Any such Government audits shall be conducted in accordance with Government Auditing Standards and the cost principles in OMB Circular No. A-87 and other applicable cost principles and regulations. The costs of Government audits performed in accordance with this paragraph shall be included in *total study costs* and shared in accordance with the provisions of this Agreement.

ARTICLE VII - FEDERAL AND STATE LAWS

In the exercise of their respective rights and obligations under this Agreement, the Non-Federal Sponsor and the Government shall comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto and Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army".

ARTICLE VIII - RELATIONSHIP OF PARTIES

A. In the exercise of their respective rights and obligations under this Agreement, the Government and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other.

B. In the exercise of its rights and obligations under this Agreement, neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights the other party may have to seek relief or redress against that contractor either pursuant to any cause of action that the other party may have or for violation of any law.

ARTICLE IX - TERMINATION OR SUSPENSION

A. Prior to conclusion of the *period of study*, upon 30 calendar days written notice to the other party, either party may elect without penalty to terminate this Agreement or to suspend future performance under this Agreement. In the event that either party elects to suspend future performance under this Agreement pursuant to this paragraph, such suspension shall remain in effect until either the Government or the Non-Federal Sponsor elects to terminate this Agreement.

B. If at any time the Non-Federal Sponsor fails to fulfill its obligations under this Agreement, the Assistant Secretary of the Army (Civil Works) shall terminate this Agreement or suspend future performance under this Agreement unless he determines that continuation of performance of the *Study* is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with the *Study*.

C. In the event the Government projects that the amount of Federal funds the Government will make available to the *Study* through the then-current *fiscal year*, or the amount of Federal funds the Government will make available for the *Study* through the upcoming *fiscal year*, is not sufficient to meet the Federal share of *total study costs* that the Government projects to be incurred through the then-current or upcoming *fiscal year*, as applicable, the Government shall notify the Non-Federal Sponsor in writing of such insufficiency of funds and of the date the Government projects that the Federal funds that will have been made available to the *Study* will be exhausted. Upon the exhaustion of Federal funds made available by the Government to the *Study*, future performance under this Agreement shall be suspended. Such suspension shall remain in effect until such time that the Government notifies the Non-Federal Sponsor in writing that sufficient Federal funds are available to meet the Federal share of *total study costs* the Government projects to be incurred through the then-current or upcoming *fiscal year*, or the Government or the Non-Federal Sponsor elects to terminate this Agreement.

D. In the event that this Agreement is terminated pursuant to this Article, the parties shall

conclude their activities relating to the *Study* and conduct an accounting in accordance with Article IV.C. of this Agreement. To provide for this eventuality, the Government may reserve a percentage of total Federal funds made available for the *Study* and an equal percentage of the total funds contributed by the Non-Federal Sponsor in accordance with Article II.C.1.b. of this Agreement as a contingency to pay costs of termination, including any costs of resolution of contract claims and contract modifications. Upon termination of this Agreement, all data and information generated as part of the *Study* shall be made available to the parties to the Agreement.

E. Any termination of this Agreement or suspension of future performance under this Agreement in accordance with this Article shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment owed by the Non-Federal Sponsor shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13 week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3 month period if the period of delinquency exceeds 3 months.

ARTICLE X - NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally or sent by telegram or mailed by first-class, registered, or certified mail, as follows:

If to the Non-Federal Sponsor:

City of Chicago
Department of the Environment
30 N. LaSalle Street, Suite 2500
Chicago, Illinois 60602-2575

If to the Government:

District Engineer
USACE Chicago District
111 North Canal Street, Suite 600
Chicago, Illinois 60606

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

C. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at the earlier of such time as it is actually received or seven calendar days after it is mailed.

ARTICLE XI - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

Article XII is Optional- can be removed if requested by sponsor

ARTICLE XII - THIRD PARTY RIGHTS, BENEFITS, OR LIABILITIES

Nothing in this Agreement is intended, nor may be construed, to create any rights, confer any benefits, or relieve any liability, of any kind whatsoever in any third person not party to this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Engineer.

DEPARTMENT OF THE ARMY

BY: _____
John D. Drolet
District Engineer

DATE: 8-16-2007

THE CITY OF CHICAGO

BY: _____
Richard M. Daley
Mayor

DATE: 8-13-07

CERTIFICATE OF AUTHORITY

I, Mara S. Georges, do hereby certify that I am the principal legal officer of the City of Chicago, that the City of Chicago is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the City of Chicago in connection with the feasibility study for the South Branch of the Chicago River Feasibility Study, and to pay damages, if necessary, in the event of the failure to perform in accordance with the terms of this Agreement and that the persons who have executed this Agreement on behalf of the City of Chicago have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this 13th day of August 2007.

Mara S. Georges
Corporation Counsel

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Richard M. Daley by MH

Richard M. Daley
Mayor

DATE: 8-13-07

NOTES